April 1934

RAILWAY TRACK and STRUCTURES

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FORMERLY Railway Engineering and Maintenance

A paying investment

Our powerful railway spring washers more than pay for themselves by reducing costs of maintenance—and furthermore they *improve* your track.

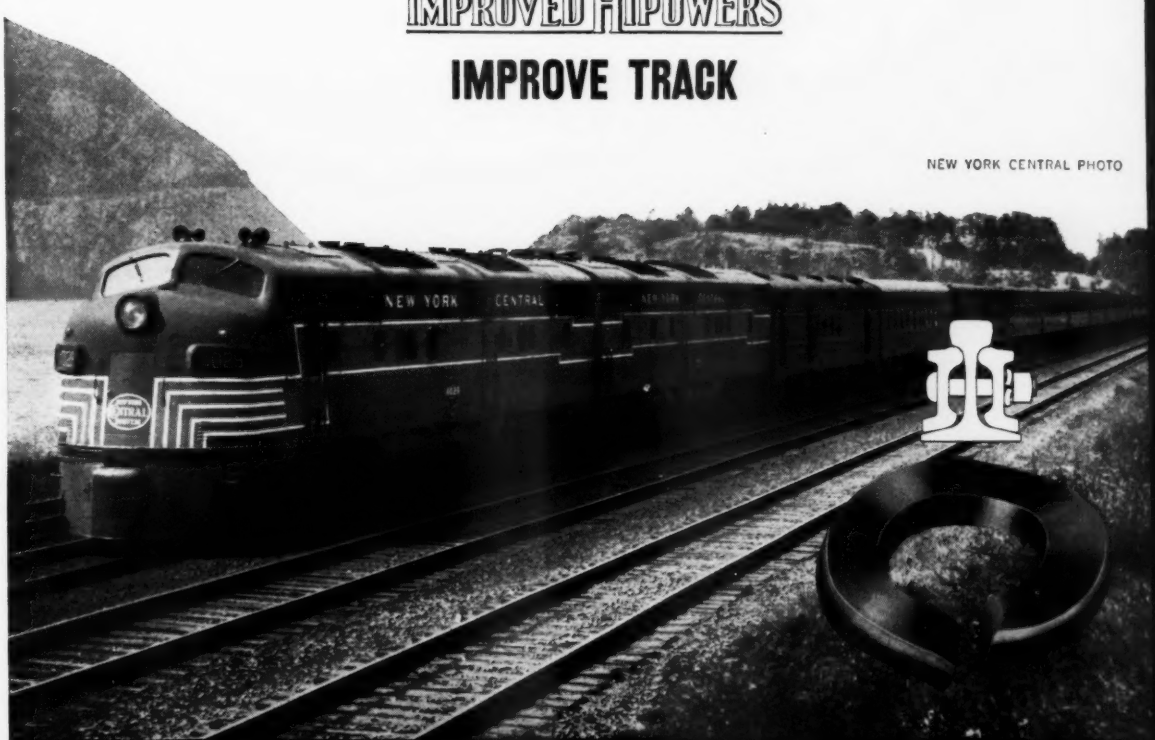
Your bolts will need retightening less frequently. The great reserve power of these springs helps to prevent the battering of your rail ends.

They absorb shocks and stresses—equalizing bolt tensions—and keeping joints resilient.

IMPROVED HIPOWERS

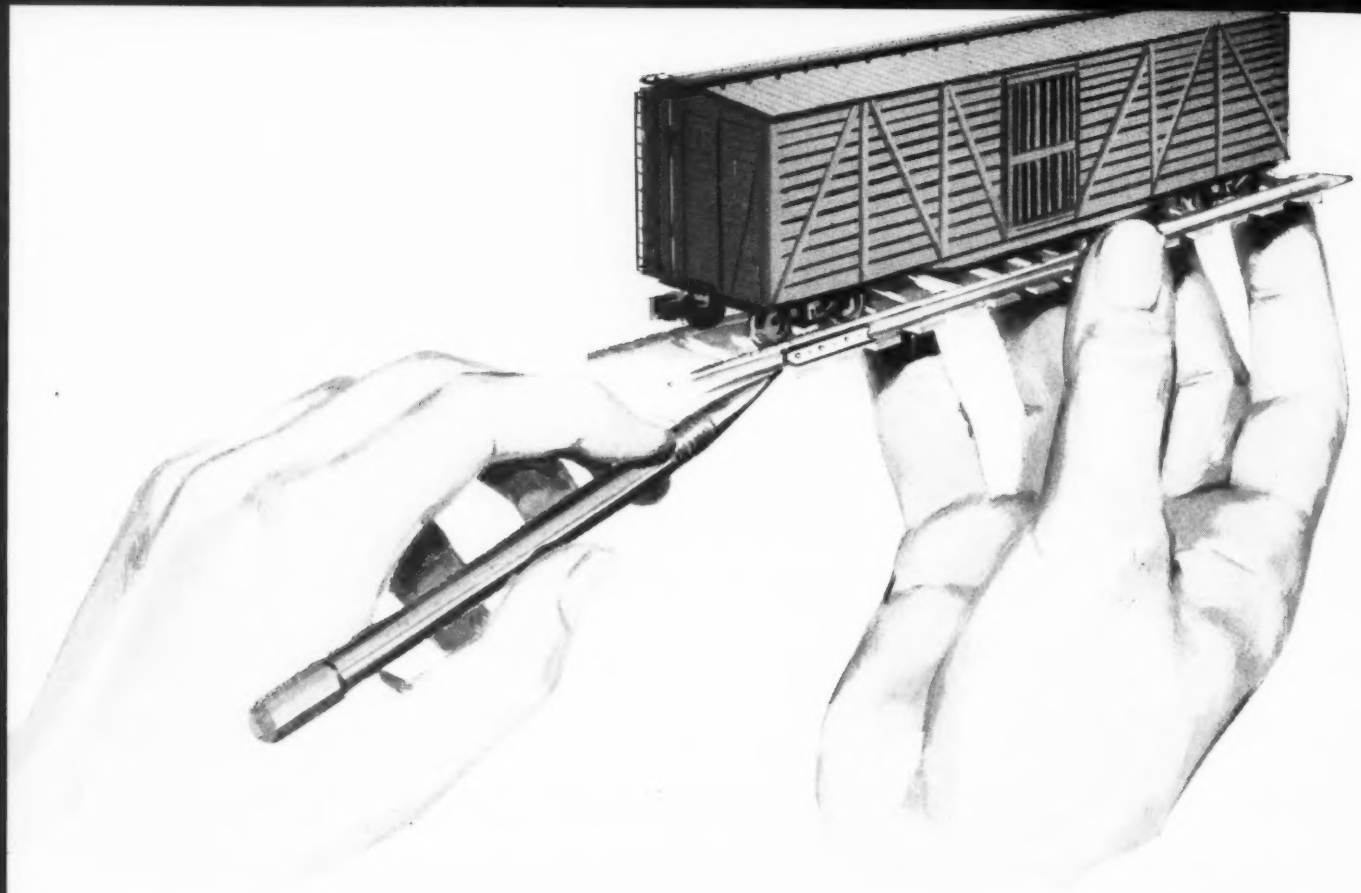
IMPROVE TRACK

NEW YORK CENTRAL PHOTO



THE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

A COMPLETE LINE OF RAILWAY SPRING WASHERS



Don't leave it to chance or guesswork!

A pre-calculated and maintained pressure in bolted parts will help reduce your maintenance costs . . .

WHEN A Reliance Hy-Pressure Hy-Crome Spring Washer is tightened, it stores up initial energy to return to its normal free height. When looseness within the rail joint assembly occurs as a result of bolt stretch, vibration, climatic changes or normal wear, the Hy-Pressure Hy-Crome Spring Washer exerts that stored up energy (reactive pressure) against the nut face and rail joint bars, thus keeping the rail joint assembly **tighter longer** between maintenance periods.

Reliance Hy-Pressure Hy-Crome Spring Washers are manufactured to exacting specifications from special cold drawn spring steel to give non-fatiguing reactive pressure under extreme conditions and act as a hardened thrust bearing to allow tighter tightening torque.

For more information specifically applied to your own rail joint problems, write today requesting a visit from one of our railway fastening engineers. Our engineers are fully experienced in track fastening procedures and will be glad to make recommendations to fit your needs.

RELIANCE
HY-PRESSURE
HY-CROME
spring washers

"Edgemark of Quality"

EATON **MANUFACTURING COMPANY, RELIANCE DIVISION**

OFFICE AND PLANTS • MASSILLON, OHIO
SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
SAN FRANCISCO • MONTREAL

NEW PORTLAND, ME., YARD HAS HEAT-TREATED STOCK RAILS—This is one of ten new turnouts in the newly relocated yard of the Portland Terminal Company, a subsidiary of the Maine Central Railroad. These turnouts feature Bethlehem heat-treated stock rails. Bethlehem heat-treating facilities and techniques can treat switch points, stock rails or other trackwork up to 60 ft in length, to reduce battering and cutting of rail heads. If you have an improvement program under way, call in a Bethlehem engineer. Whether on heat-treating or some other phase of track-planning, he can talk your language and help you plan your layout. Just get in touch with the Bethlehem sales office nearest you.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: to railroad employees only in the United States and Possessions, and Canada, one year $1.50; $2.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 50, No. 4.

Rubber tires speed ditching and road-bed widening

Tournapulls whip restricted quarters, complete 1-mile cycle every 8 minutes on drainage job for CB&Q RR

When the Chicago Burlington & Quincy decided to improve drainage along a 5½-mile section of main-line track near Golden in western Illinois, they contracted all dirt-moving to K & K Excavators, Skokie, Ill. Construction involved widening the shoulder to 13′ from track center, breaking off a 3-to-1 slope to a 7 ft. flat-bottom ditch, and backsloping at 2-to-1. To handle 85% of the job, K & K brought in 1 C and 2 D Tournapulls.

Eliminates cut-outs and turn-arounds

Time studies, taken with Tournapulls loading in narrow ditch cut, show the "D's" got 5 pay yds. of clay, black sandy loam and topsoil in 40 seconds . . . the "C", 10 pay yds. in 60 seconds. Mile-long cycles took as little as 8 minutes. With their ability to turn around non-stop in a space only 12′ 8″ wide, Tournapulls eliminated the need for building cut-outs or turn-arounds. They maneuvered easily in the narrow cuts between rails and banks.

"I think the Tournapulls are very good machines," says Field Superintendent Ray Scherf. "I like them for *any* kind of dirt work."

Adds Operator Woody Kemp, "Electric-control Tournapulls are fast and will move a lot of dirt. They're easy to handle in narrow places."

Through traffic stays on schedule as "D" loads dirt along the right-of-way. Big low-pressure tires cross tracks without damage to ties, rails or tires. No planking is needed.

Raise roadbeds without removing rails

The same D Tournapulls worked at Bensenville, Ill., when they put in a 40,000-yd. hump for the Milwaukee Road. K & K also used them to build new rail bed for the same line at Terre Haute, Ind. Here, the 2 units self-loaded, hauled, 9,700 cu. yds. in 60 hours. On a third job — this one for the Illinois Central — the versatile units hauled on the rails, spreading sand and cinders to rail height. The IC then raised rails and ties without taking them out.

For lower-cost contract grading it will pay you in both time and money to call in contractors with off-track LeTourneau-Westinghouse machines. Tournapulls also can help you on your own maintenance and construction dirt-moving. Let us arrange a demonstration on your line so you can check their advantages for yourself.

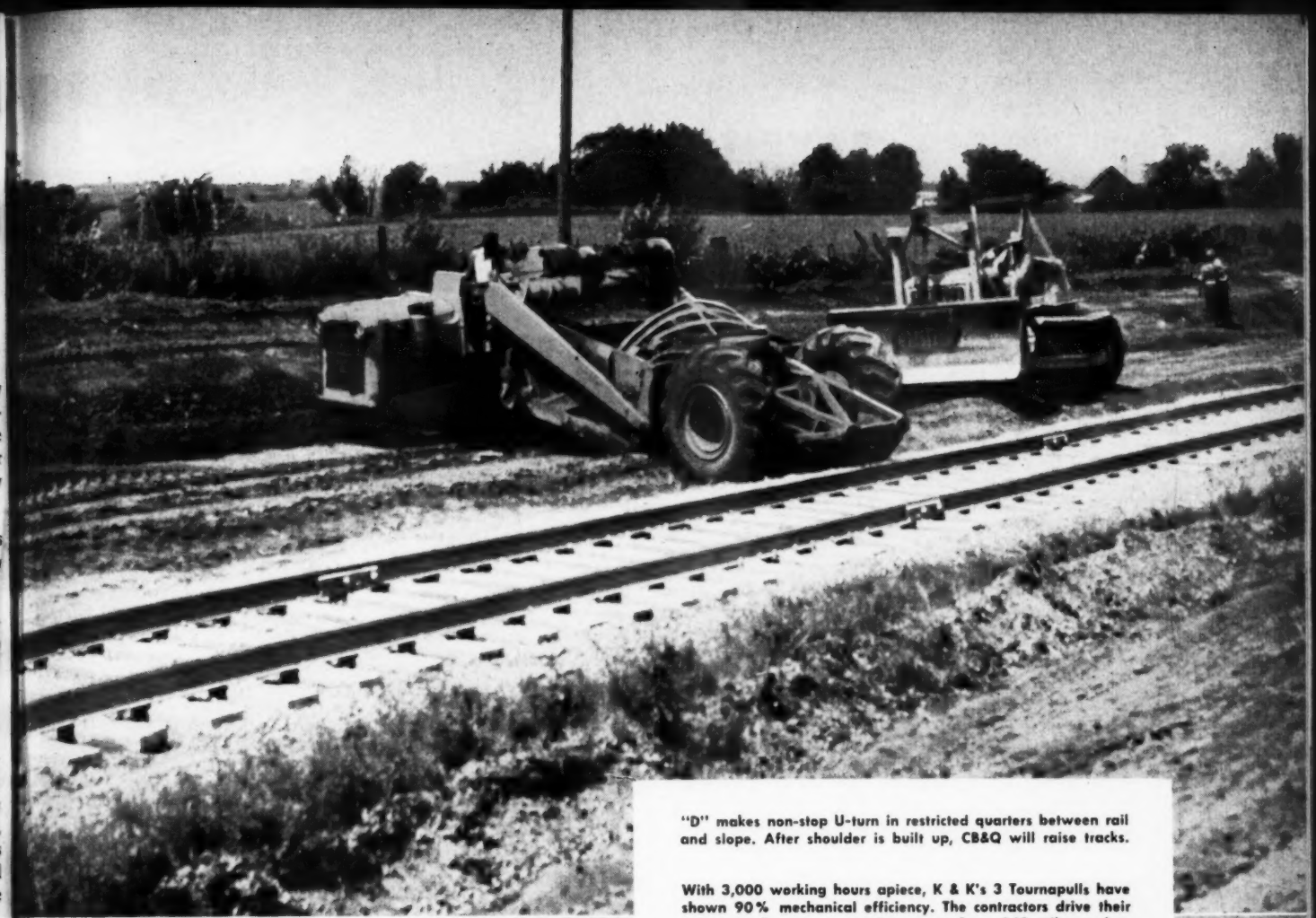
Recently, Westinghouse Air Brake Company purchased from R. G. LeTourneau, Inc. their earthmoving and related products together with their Peoria, Toccoa, and Australian factories. Adding the high quality standards, precision manufacturing experience, and research facilities of Westinghouse Air Brake to the earthmoving developments of LeTourneau, gives you assurance that the improved line of equipment offered by this strong new company is the finest on the market. Be sure to check LeTourneau-Westinghouse before you buy.

Tournapull—Trademark Reg. U.S. Pat. Off. PDP-519-RR

LeTourneau-Westinghouse Company

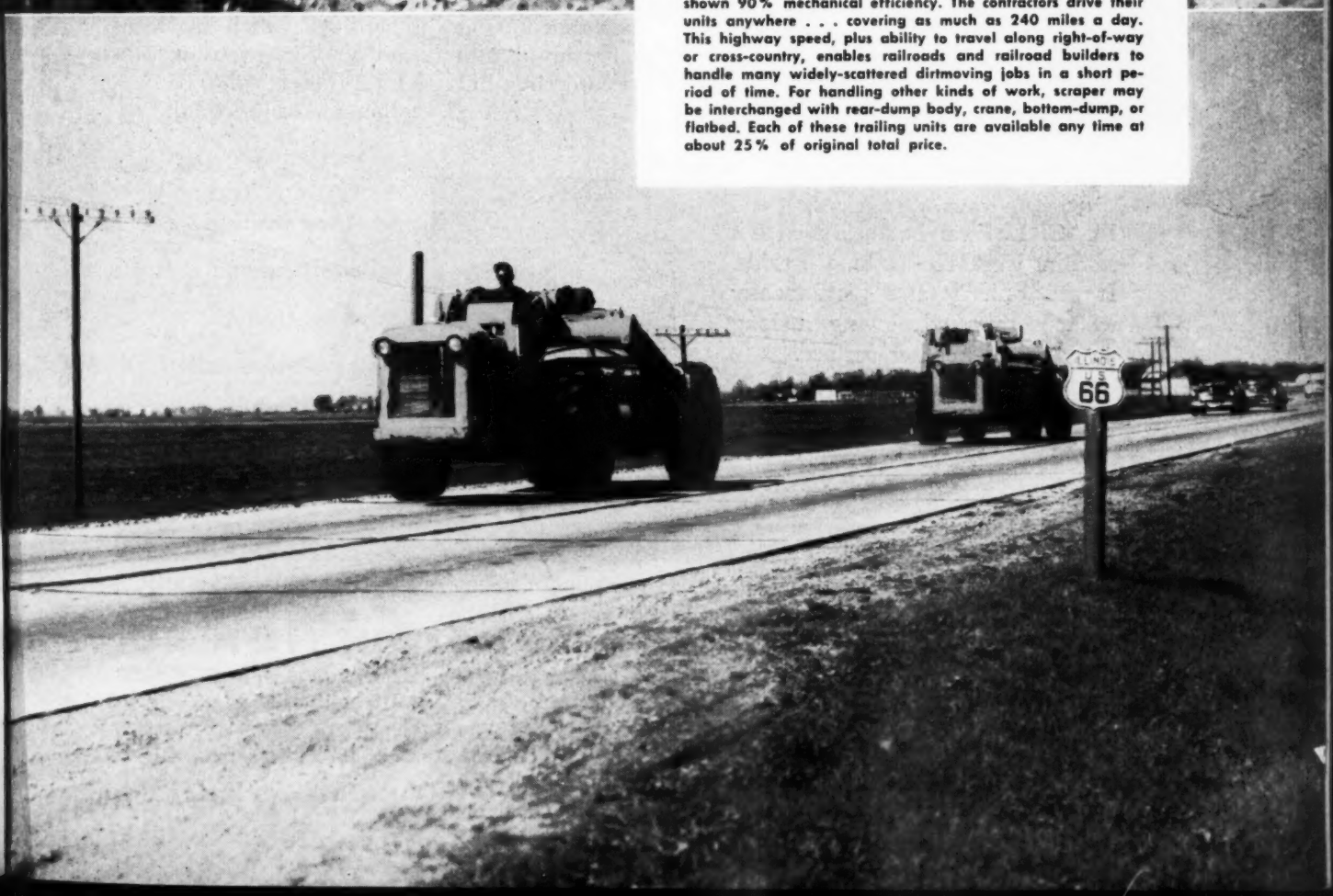
PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



"D" makes non-stop U-turn in restricted quarters between rail and slope. After shoulder is built up, CB&Q will raise tracks.

With 3,000 working hours apiece, K & K's 3 Tournapulls have shown 90% mechanical efficiency. The contractors drive their units anywhere . . . covering as much as 240 miles a day. This highway speed, plus ability to travel along right-of-way or cross-country, enables railroads and railroad builders to handle many widely-scattered dirtmoving jobs in a short period of time. For handling other kinds of work, scraper may be interchanged with rear-dump body, crane, bottom-dump, or flatbed. Each of these trailing units are available any time at about 25% of original total price.



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BLACRETE®

the tough, durable, bituminous concrete paving mix

BLACRETE is a bituminous concrete made with liquid asphalt scientifically mixed with sand and stone. Every step in the manufacture of BLACRETE is under constant, capable supervision . . . backed by 40 years of Rock Road experience. It contains Kotal, an all-weather bonding ingredient which increases cohesion of asphalt and improves resistance to weathering. BLACRETE is designed to be suitable to your local weather and traffic conditions.

BLACRETE can be stock-piled as it remains workable for long periods. It sets quickly and permanently when compacted, giving a long wearing, all-weather surface.

Ideal for

- Railroad Crossings
- Station Platforms
- Parking Areas
- Roads—Walks—Ballast

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immediately in railroad car loads or in truck load quantities from plants located in middle and southwest.

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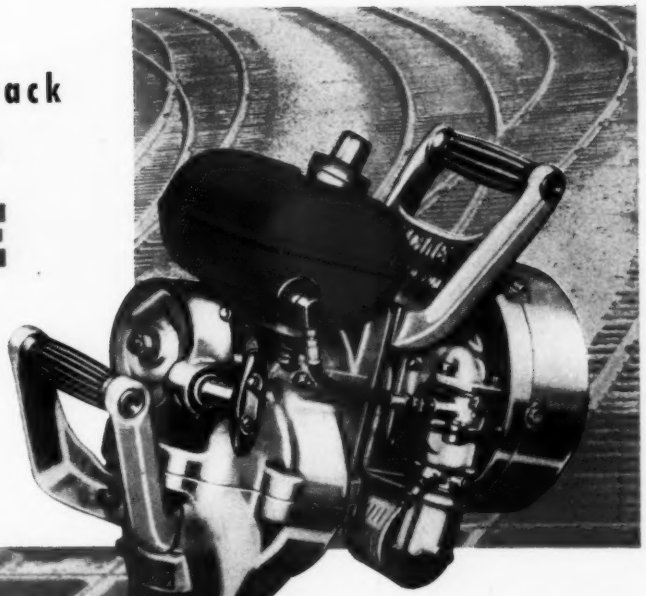
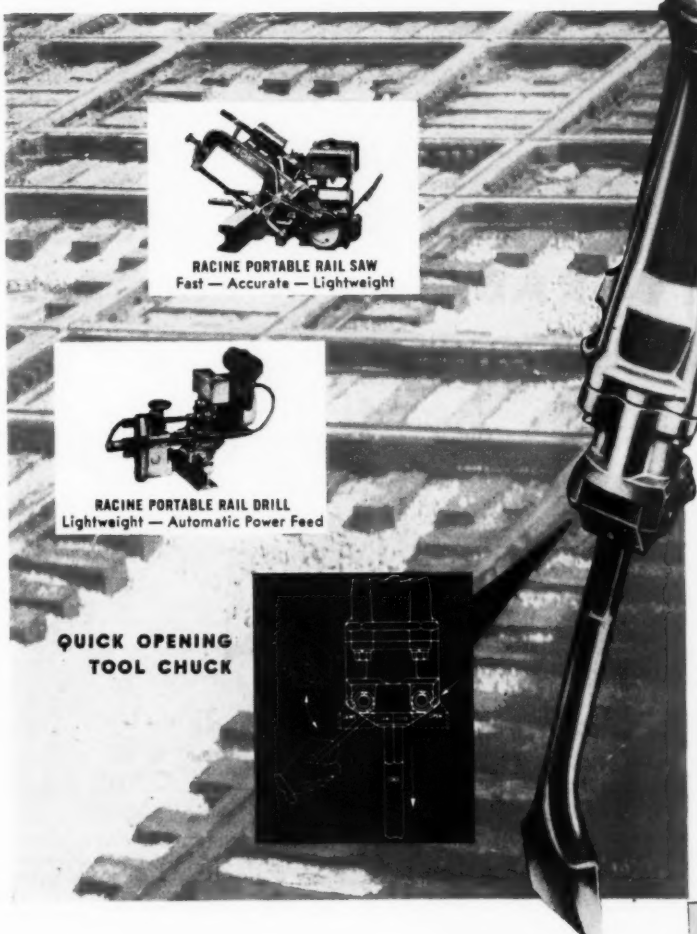
5915 Rogers Avenue • Chicago 30, Illinois • Phone: SPring 7-8800

You, too, can reduce track maintenance costs with

RACINE PORTABLE RAIL TOOLS





RACINE PORTABLE RAIL SAW
Fast — Accurate — Lightweight

RACINE PORTABLE RAIL DRILL
Lightweight — Automatic Power Feed

QUICK OPENING TOOL CHUCK

The NEW multi-use RACINE PORTABLE TIE TAMPER

- **LABOR SAVING** — One man operation — gives you the equivalent of eight hours more work every day.
- **EFFICIENT** — Speeds up manpower efficiency by reducing fatigue. Easily carried, easily operated — shock-free. Delivers 1500 high velocity "stirring action" blows per minute.
- **QUALITY CONSTRUCTION** — New quick-opening tool chuck. Tools can be changed in less than a minute. Easy starting 1¼ H.P., 2 cycle air cooled gasoline engine with self-retrieving replaceable cable type starter. Overall size of tamper 15" x 30". Weight 55 lbs.

RACINE

HYDRAULICS & MACHINERY, INC.
RACINE, WISCONSIN

WRITE FOR NEW CATALOG

showing Racine's complete line of Rail Tools. Address RACINE HYDRAULICS & MACHINERY, INC., 2038 Albert St., Racine, Wisconsin.

"We've used the GRADALL for more different jobs than any other machine!"

MR. C. H. VOGT, *Chief Engineer*
Maintenance-of-Way Department
CENTRAL RAILROAD OF NEW JERSEY

● "It's the best machine for railroads, along with the bulldozer, that I've ever seen," Mr. Vogt went on to say. "We've lined track, spread asphalt, used it as a crane, plus many other more usual jobs."

Lining sections of track is one example of the many "bonus" jobs Jersey Central handles with the Gradall. Its *arm-action* boom reaches out, hooks the bucket around ties and rail, and pulls the section of track into place. Two men check track alignment at either end. One operator handles the Gradall, equipped with remote control*. The job previously required 15 men!

Jersey Central has also come up with another new job for the Gradall—loading piles of ties. Extra jobs like these—jobs you can do *in addition* to regular work—really make the Gradall pay off! With a single investment you'll have a machine that does the work of many—a *busy* machine that gives you more on-the-job hours the year 'round.

The Gradall is also available in two other models—the Railroad Gradall (shown at right) for on-track as well as off-track work, and the new crawler-mounted Gradall for use with work trains or in marshy areas.

So before you invest in *any* maintenance or construction machine, contact us for a field demonstration of the multi-purpose Gradall. *The Warner & Swasey Company, Gradall Division, Cleveland 3, Ohio.*

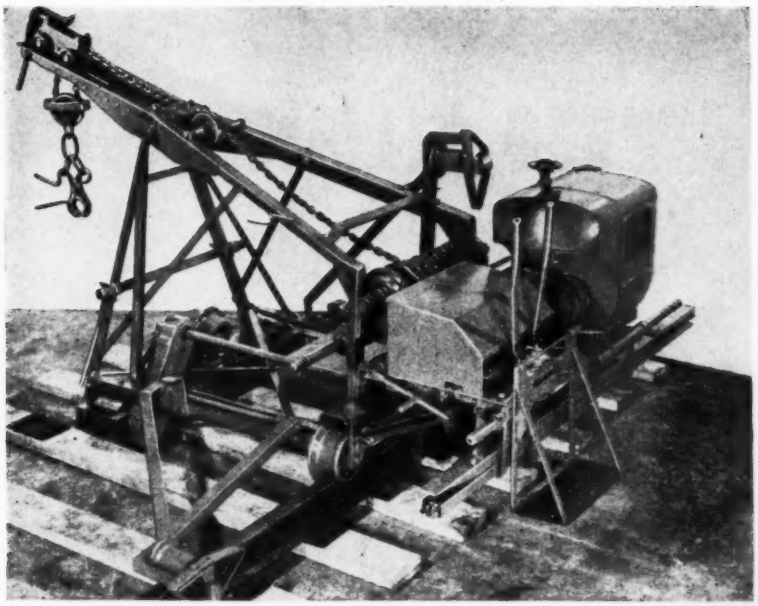
** Optional equipment*

NEW RAILROAD GRADALL—*Equipped with track-climbing tires and power steering for on-track as well as off-track maintenance. Works over every mile of track.*

Gradall
DIVISION OF WARNER & SWASEY *Cleveland*
PRECISION MACHINERY SINCE 1880

Gradall Distributors in over 75 principal cities in the United States and Canada

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY



lays standard rails

LONG RAILS

CONTINUOUS WELDED RAIL

The Meco Power Rail Layer is a SPECIALIST in RELAYING rails.

It places Standard rails, Long rails or mile long Continuous Welded rail with a minimum of labor.

The Meco Rail Layer is operated by a standard 4-cycle power unit with a machine crew of 3 to 4 men, the operator controlling all movements of the machine by two levers immediately at hand.

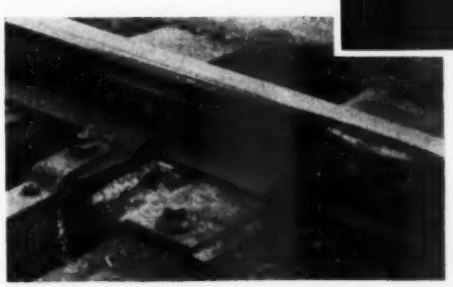
The Meco easily sets in the rails for a large rail gang of 100 men or more, and has time to spare.

THE MECO RAIL & FLANGE LUBRICATOR reduces friction between rails and wheel flanges on curves, thereby doubles to quadruples curve rail and locomotive flange life.

TYLIFE — a new treatment for bonding spikes and tie plugs firmly into cross ties and bridge timbers.

★ **Maintenance Equipment Company** ★

RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS



THE MACK REVERSIBLE SWITCH POINT PROTECTOR makes switch rails last 3 to 4 times longer, then is reversed and the switch rail life again extended several times.

THE RYD-IN AUTOMATIC COUPLER safely and quickly couples trailers to motor cars. They stay coupled until released by hand.

Y624.

Complete

BRUSH and WEED KILLING SERVICE

PIONEER in the improved right-of-way brush control

Spraying equipment specifically designed and proven for the purpose

LEADER in effective grass and weed killing control

- TCA
- OILS
- 2, 4-D
- PENTACHLOROPHENOL
- BRUSH KILLERS

For Your Railroad . . .

- PROVEN CHEMICALS
- TRAINED PERSONNEL
- SPECIALIZED EQUIPMENT
- RECOGNIZED EXPERIENCE
- INSURED RESPONSIBILITY

Introducing . . .

- **DALAPON**

A new systemic grass killer actively translocated throughout the plant system by absorption through either the foliage or root structure.

Spray Services *Incorporated*

Pioneers in Right-of-Way Spraying

P. O. BOX 5444 HUNTINGTON, W. VA.

TYPICAL INSTALLATION OF BIRD SELF-SEALING TIE PADS. *On cross ties in open track and on switch ties. At right, a close-up of installation on switch ties. Photographs courtesy of the Richmond, Fredericksburg & Potomac R. R. Company.*

Slash your tie costs 50% with BIRD Self-Sealing TIE PADS

HOW? BIRD Self-Sealing Tie Pads form a waterproof, dustproof seal on the tie that protects the vulnerable area under the plates and around the spikes. Mechanical wear and plate penetration are eliminated.

YOU GET 50% more tie life from new ties.

YOU GET twice the normal remaining life expectancy from old ties that can be adzed to a smooth surface of sound wood.

YOU SAVE on gauge, line, and surface costs in addition to savings on tie life.

BIRD PROVEN BEST! The original self-sealing tie pad – proven by years of in-track experience.

WHERE?

1. On the joint and shoulder ties of insulated joints.
2. On new or older bridge decks.
3. On switch timbers.
4. Under crossing frogs.
5. Through highway grade crossings and station platforms.
6. On curves to insure holding track to gauge and surface.
7. With smaller tie plates.

WHEN? Start now. Write today to BIRD Tie Pads, Dept. HTS-4, East Walpole, Mass.

BUY THE BEST **BIRD & SON, inc.** Established 1795 ***BUY BIRD***

Field assembly of Monotube piles is quickly and easily accomplished using a "come-along" with two cable chokers.

Driven pile being cut off at proper height. Use of cut-off sections as extensions minimizes waste.

Welding extension to driven base section of pile on right while driving of pile on left continues. No lost time.

How **MONOTUBE PILES** meet the need for **VARIATION IN DRIVEN LENGTHS**

UNLESS you've already had first-hand experience with Monotube piles, you might be amazed at how their "easy field extendibility" pays off. Engineers and contractors are taking advantage of it on job after job . . .

Many contractors set up a simple welding rack to do their own field assembly right on the job, thereby furnishing the driver with one-piece piles to approximate required length.

Another procedure is to weld on extensions as driving progresses. While one pile is being extended, driving continues on an adjacent pile. No lost time.

Such practices are completely practical with Monotubes because they combine light weight and easy handling with cold-rolled high strength. Weld-splicing goes easy and fast. No difficult welding operations.

Get the facts on *all* cost-important Monotube features. Write to The Union Metal Manufacturing Co., Canton 5, Ohio.

Monotube Foundation Piles

UNION METAL

presenting the NEW NORDBERG TRAKLINER

. . . another TIME and MONEY-SAVING MAINTENANCE MACHINE

PROVED IN SERVICE

The *TRAKLINER* has been proved in service on leading roads. Experience has shown that extreme accuracy is easily maintained, at savings in excess of $150 a mile.

The *TRAKLINER,* latest addition to the rapidly expanding line of Nordberg track maintenance machinery, provides "Mechanical Muscles" for track lining operations. With this new self-contained, self-propelled unit, you can now do a faster, more accurate track lining job at lower cost.

Built to the same high efficiency standards as all Nordberg Machinery, the *TRAKLINER* utilizes easily controlled hydraulic power to exert up to 5,000 lbs. force. Track can be moved laterally any desired amount.

Now is the time to start saving time and money on *your* track lining operations . . . for full details about the Nordberg *TRAKLINER,* write for *BULLETIN 230.*

R354

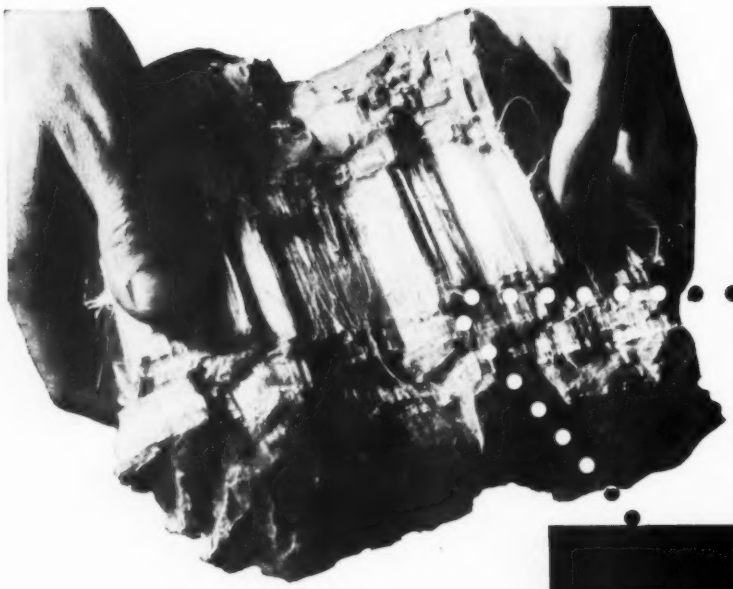
USE NORDBERG "Mechanical Muscles"* TO DO A BETTER, FASTER MAINTENANCE JOB AT LOWER COST

*Trademark

ADZING MACHINE • BALLAST ROUTER • CRIBEX® • BALLASTEX® • SCREENEX® • HYDRAULIC & MECHANICAL SPIKE PULLERS • SPIKE HAMMER • TIE DRILL • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • TRACK SHIFTER • DSL YARD CLEANER • TRAKLINER • DUN-RITE GAGING MACHINE • GANDY—TIE PULLER and INSERTER

NORDBERG MFG. CO., *Milwaukee, Wis.*

NORDBERG MACHINERY



From the ageless mineral

...ASBESTOS

...come these fireproof long-wearing versatile

JOHNS-MANVILLE CONSTRUCTION MATERIALS

In thousands of railroad installations throughout the country, Johns-Manville Asbestos construction materials are helping to reduce construction and maintenance costs.

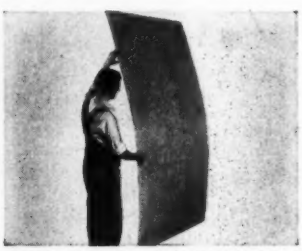
By combining strong, durable asbestos fibres with another permanent material—portland cement—Johns-Manville has succeeded in developing a variety of construction materials that are long-lasting, fireproof and highly resistant to corrosion. These products need no preservative treatment, require little if any maintenance.

Illustrated are six Johns-Manville asbestos-cement products that are widely used in construction. For further information about these, or other J-M products for railroad use, write to Johns-Manville, Box 60, New York 16, N. Y.

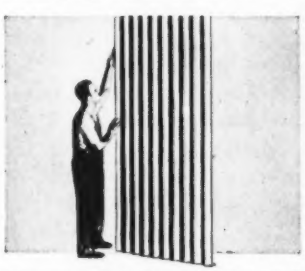
Smoothgrain® Asbestos Siding. Smooth-surfaced with grained appearance; silicone sealed against moisture, rigid, pre-punched for nailing. Available in 7 different colors and in white.

American Colonial Shingles. Each shingle equivalent to 5 ordinary roofing shingles. Pre-punched for nailing, self-aligning, easy and quick to apply. Handsome grained effect in 9 beautiful colors.

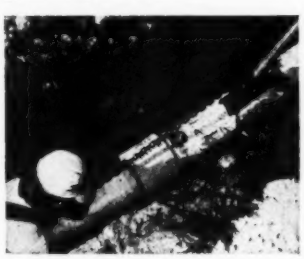
Flexstone® Asbestos Roofing. The most enduring, and economical type of roof protection. This built-up roofing resists weather, wear and the drying-out action of the sun.



Asbestos Flexboard.® Large sheets can be used indoors or out for new building or remodelling. Easy to handle, flexible, fireproof. Needs no paint for preservation.



Corrugated Asbestos Transite.® Large, strong sheets are easy to apply. Ideal for roofs and sidewalls of buildings, such as freight houses and diesel shops.



Transite® Asbestos-Cement Pipe. Completely non-metallic, it won't rust or rot. Resists corrosion. Light in weight, easy to install. Used for water and sewage lines.

Johns-Manville 96 YEARS OF SERVICE TO TRANSPORTATION

When they say,
"it's the

MOST USED

MOST ABUSED

MOST USEFUL

PIECE OF EQUIPMENT WE HAVE"

Central Construction Co., Indianola, Iowa is talking about its 4-wheel-drive "PAYLOADER" tractor-shovel.

Thousands of others like them too — and so will you. See your nearby "PAYLOADER" Distributor, or write The Frank G. Hough Co., 751 Sunnyside Ave., Libertyville, Illinois.

YOU CAN'T COMPETE IF YOUR EQUIPMENT IS OBSOLETE

PAYLOADER®

A new DOW development . . . DOW

DALAPON GIVES GOOD (sodium salt) GRASS CONTROL IN RAILWAY ROADBEDS

Systemic grass killer is being introduced this season for industrial uses only

Grass in ballast with its attendant hazard of churning track is a job for Dalapon*. This chemical was developed as a grass killer in Dow laboratories and tested for several years by our product development group. These tests have shown that Dalapon (sodium salt) gives a high degree of control of quack grass, Johnson grass, Bermuda grass, para grass, and Kentucky and Canada blue grass. It also is effective for control of annual grasses such as crab and foxtail.

Dalapon (sodium salt) is a *systemic* grass killer. When applied as a water spray on grass foliage, it is translocated throughout the plant, effecting a high degree of root kill. It may be used in combination with other Dow weed killers for control of weeds and grasses in roadbeds and on railroad ballast and berm areas. Dalapon (sodium salt) is less susceptible to weather conditions than some of the present grass killers. It presents no hazard to grazing livestock or to wild life.

Since Dalapon (sodium salt) has been especially successful in the control of grasses in the roadbed, we suggest that you contact your vegetation control service organization or write direct to Midland for further information. THE DOW CHEMICAL COMPANY, Agricultural Chemical Sales Department, Midland, Michigan.

**Dalapon is 2,2-Dichloropropionic Acid. The control of vegetation with Dalapon is the subject of U. S. Patent 2,642,354.*

you can depend on DOW AGRICULTURAL CHEMICALS DOW

Low-cost, mobile, air power gives you extra hours of usage

Saves time and money on tie-tamping and many other M/W jobs

ONE man driving Tractair puts 105 cfm of air to work where and when you need it—lets you make more use of work-saving Le Roi-CLEVELAND air tools. On a tie-tamping project, for instance, Tractair delivers enough air to run eight standard Le Roi-CLEVELAND tie tampers.

And it can be equipped to give your men a hand—and cut costs—on other M/W jobs. With attachments, it lifts, loads, augers, mows, backfills, powers a winch, and does the work of other specialized equipment.

Tractair has good traction and low center of gravity. It goes almost anywhere, climbs embankments, works on a two-to-one slope with safety. Tractair also has high clearance. It readily crosses or straddles heavy-duty rail — it's ideal for use in multiple track territory.

The work-equipment officials of many roads can tell you that Tractair is truly invaluable the year around. See for yourself—ask us to show you Tractair at work. And — write for job-data sheets and bulletins.

LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co.
Railroad Sales Department
327 South La Salle Street • Chicago 4, Illinois

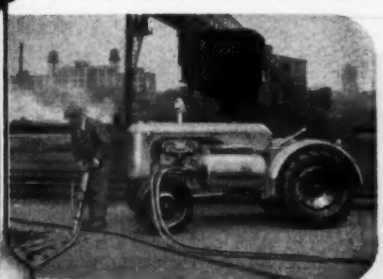
Do all these jobs — and more — with TRACTAIR:

- Tamp ties; drive spikes.
- Break pavement.
- Drive mail point for grouting operation.
- Do ditching, light grading, weed mowing.
- Drive earth augers.
- Stockpile ballast, cinders, other materials.
- Handle off-season work for B&B, Signal, T&T, and Water-Service Departments.

Le Roi-CLEVELAND No. 10 Tie Tamper, shown at left, weighs only 36 lbs. Section hands can keep up with the high-speed blows without tiring. The work is faster and more uniform.

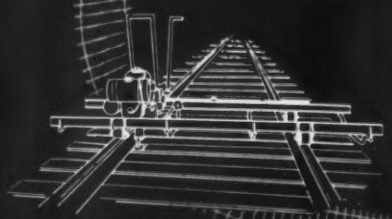
This Le Roi Airmaster Compressor is one of a complete line of portable, heavy-duty gas and diesel air compressors ranging from 60 cfm to 600 cfm. Available in railcar and rubber-tired models.

With the snow-plow attachment, Tractair pays off-season dividends, clearing yards, sidings, loading tracks, access roads. Rotary-broom attachment is available also.

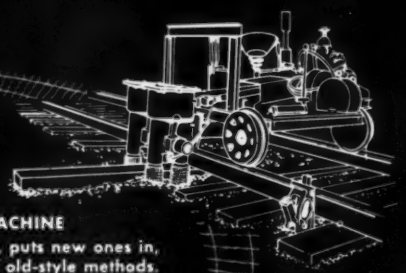


Here, Tractair runs a Le Roi-CLEVELAND Paving Breaker to repair a team track roadway. You can use Tractair to operate other Le Roi-CLEVELAND air tools, also.

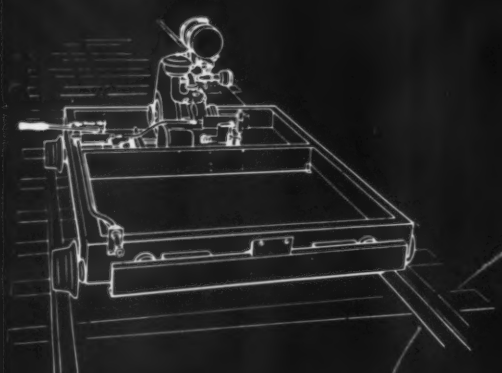
to keep
track
up to the
new Matisa
standard of maintenance



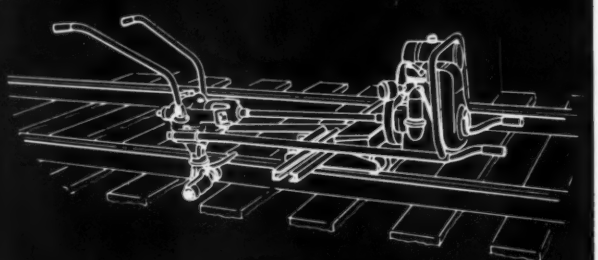
TIE ADZING MACHINE
No need to remove the rails! Merely remove tie-plates and adze under either rail, as desired. Saves time, labor, ties.



TIE RENEWAL MACHINE
Takes old ties out, puts new ones in, at half the cost of old-style methods. Leaves no rough track behind. Knurled steel rollers move new ties in either direction with the flick of a lever, spotting them precisely where wanted.



AUTOMATIC JACK CARRIER
For *unattended* shuttle service between a *Matisa Tamper* and the track raising gang, this self-powered car automatically *loads itself*, reverses its direction, and even stops by itself!



POWER WRENCH
Portable, rugged, lightweight, but engineered for *precision* work. Works on *both rails* without turning machine. An adjustable spring-loaded disc clutch affords the means of applying a predetermined and *constant* torque to track bolts.

Matisa
EQUIPMENT CORP.
224 S. MICHIGAN BLVD. · CHICAGO 4
TRACKWORK SPECIALISTS ALL OVER THE WORLD

NEWS NOTES...

...a resumé of current events throughout the railroad world

APRIL, 1954

" . . . There is only one mass transporter—the railroads. They've got to stay here. You can't go to war without them, for war is mass transportation." These statements were made in a recent address by Chairman J. Monroe Johnson of the Interstate Commerce Commission. Colonel Johnson wants to see a rate structure developed which will maintain the railroads in health and vigor.

•

A hopeful picture of railroad traffic and earnings for 1954 as a whole was drawn recently by Dr. J. H. Parmelee, consulting economist to the Association of American Railroads. "Railroad freight traffic seems likely to run below that of 1953 until June or July, but after July will be comparable to the . . . corresponding period of 1953," he said. "My guess on ton-miles would be a 10 per cent decrease for the first half of the year, and for the second half a level closer to or even exceeding that of 1953," he declared.

•

Amazed city officials of Little Rock, Ark., have learned that 23 truck lines with terminals in their city paid a total of only $447 in city taxes in one year. The astonishing truth was learned in connection with an investigation of the truckers' request for the repaving of streets used by their vehicles.

•

The Pennsylvania's total investment of $31 million in mechanized maintenance equipment is saving that company approximately $24 million—about 77 per cent—per year, according to a statement made by P. M. Roeper, superintendent of the PRR's New York division, in an address before the New York Railroad Club.

•

A general 10 per cent increase in railroad rates for handling mail became effective April 1. The Interstate Commerce Commission approved the boost, which was not opposed by the Post Office Department. It will produce added revenue of about $32 million a year.

•

The Postmaster General would get full discretion to substitute highway post office operations for railway mail services under the provisions of a bill which has been passed by the United States Senate. The bill would amend the 1940 mail-trucking act to remove the restriction which prohibits establishment of sorting-en-route trucking operations unless it is found that railroad facilities are inadequate or not available. The bill has now been referred to the Committee on Post Office and Civil Service of the House of Representatives.

•

The ICC reports a decline in train accidents in 1953 compared with 1952, but a rise in passenger deaths and injuries resulting from these accidents. Accidents dropped from 10,085 in 1952 to 8,973 in 1953. Deaths rose from none in 1952 to 21 in 1953 and injuries from 277 to 598.

NEWS NOTES (continued)

Piggyback operations on the Chicago & North Western have produced a substantial and unexpected saving. President Paul E. Feucht told members of his traffic staff that in the first three months of operation there was not a single claim for damage, and handling costs had dropped because the cost of handling freight from truck to freight car and back again had been eliminated.

•

The Texas & New Orleans Lines of the Southern Pacific have inaugurated piggyback service for handling lcl traffic between Houston and Ft. Worth-Dallas, Tex. For some time these lines have been operating piggyback service between Houston and Beaumont, Tex., and Lake Charles, La.

•

Revenue derived from the operation of trailers-on-flats service on the New Haven totaled $1,358,970 in 1952 and $1,991,262 in 1953. Trailers handled in the two years numbered 34,505 and 50,154, respectively. This road now has 360 specially equipped flat cars in piggyback service, with another 100 on order.

•

Between 1928 and 1952, Class I line-haul railroads lost nearly one third of their "potential" freight tonnage, according to a study made by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. This is the extent to which they failed in 1952 to maintain their 1948 position as carriers of freight originating from production in this country. Total production increased more than 55 per cent between 1928 and 1952, but railroad tonnage was up only about 4 per cent.

•

The House of Representatives has passed the revised excise tax bill which would cut the tax on railroad passenger fares from 15 to 10 per cent. The bill now goes to the Senate for study.

•

The Santa Fe is now completely dieselized. It operates a total of 1,622 units in 977 locomotives, including 90 passenger locomotives, 552 freight locomotives and 335 switchers.

•

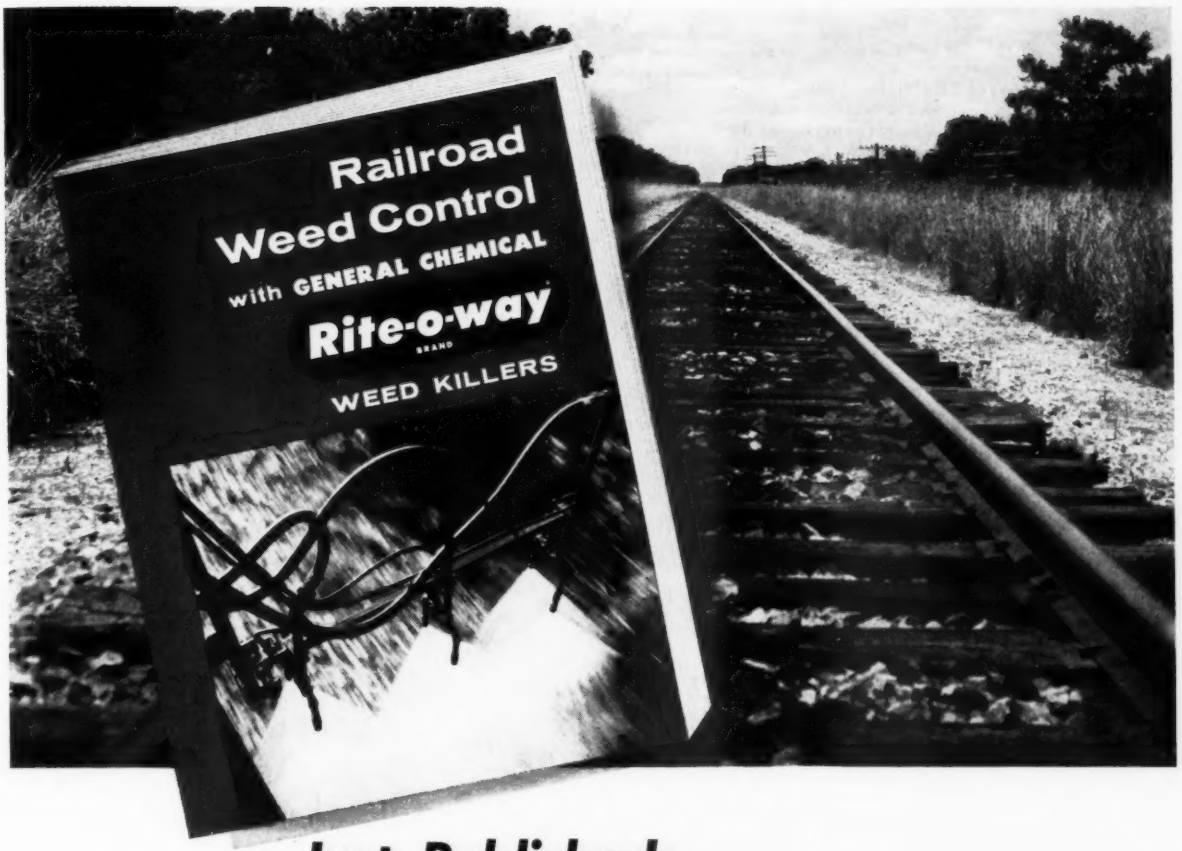
The Santa Fe has recently installed radio equipment in a locomotive cab which enables the engineer to exercise electronic control over a power switch from his seat in the cab. The installation was made on a road switcher unit in service at Carlsbad, N. M.

•

With 15 dome passenger cars already on order from the American Car & Foundry Co., the Union Pacific has added to that order an additional 20 cars, bringing the total investment to approximately $10 million.

•

The Pennsylvania and the Baltimore & Ohio have announced that round-trip coach fares between Philadelphia and Pittsburgh and between Washington, Baltimore and Pittsburgh will be cut about one-third effective April 15.



Just Published:

RAILROAD WEED CONTROL WITH GENERAL CHEMICAL Rite-o-way BRAND Weed Killers

Yours for the asking!

This new brochure shows you in word and picture what General Chemical regards as the most up-to-date, complete and versatile Railroad Weed Control Service ever offered to the Railroad Industry.

It tells you all about General's two outstanding weed control materials that cut costs and give better results because they're *double strength* for fast action, higher kill and longer protection: "Rite-o-Way" Brand TCA-Chlorate (for spray-train application on the big jobs) and "Rite-o-Way" Brand Sta-Klor* (a spray powder for dry or wet application by your regular labor crews in general maintenance work).

Make certain you'll use the best available materials and methods in your 1954 weed control program. Write now for this fast-reading, informative booklet.

*General Chemical Trade-Mark

GENERAL CHEMICAL WEED CONTROL

Weed Killer Department
GENERAL CHEMICAL DIVISION
Allied Chemical & Dye Corporation
40 Rector Street, New York 6, N. Y.

Tells How You Can Get Clean Track Quickly Plus Reduced Root Growth That Lowers Your Maintenance Costs.

Weed Killer Department
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Allied Chemical & Dye Corporation
40 Rector Street, New York 6, N. Y.

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Please send me your new booklet on Railroad Weed Control with "Rite-O-Way" Brand Weed Killers.

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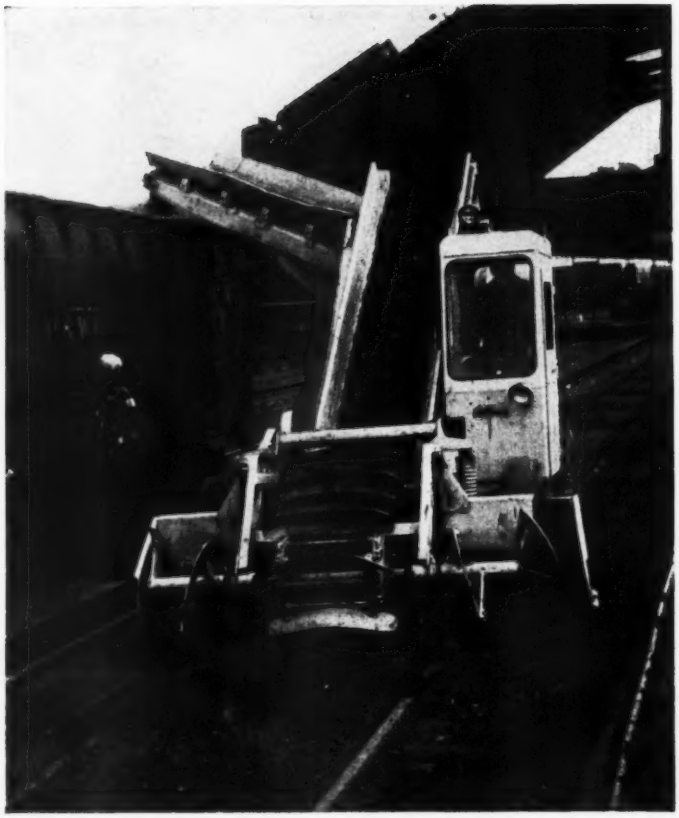
*Railroad*_____

*Address*_____

*City*_____ *State*_____ RT-4

CHEMICAL PROGRESS WEEK • May 17 to 22 • *A Better America Through Chemical Progress*

Moving steadily along at 2.0 MPH this HiLoader cleans a track-area of ore, coal and other fine materials. Materials are fed into a high hopper car, towed by a work-train.



One Man...
One Machine...
One Pass...
Cleans Full Tie-Length

More track cleaned, less manpower used—that's the record of the Athey Force-Feed HiLoader Track Cleaner. Railroad owners in various parts of the country are proving this by actual use of this off-track machine.

The HiLoader Track Cleaner is under complete control of one man in the comfortable cab. Controls for the auger and paddle-blade feeder are hydraulic, and a slight shift of a convenient lever provides precision movements at the cutting edge. The tough, rubber-covered, steel-cleated conveyor belt moves or stops at the turn of a lever. The discharge conveyor swings 55° to either side of center under hydraulic control. Steering is accomplished by a truck-type steering arrangement, with a wheel that handles like a small truck. Foot and hand throttles simplify crowding while loading.

The HiLoader has a 98-inch gather to clean both between the rails and the inter-track area. Up to 10 cubic yards of loose material can be loaded each minute. Steel augers keep materials feeding into the floating paddle-blades. The blades rise and fall to match the contour of the material. A 101 HP industrial engine provides ample power for loading at 2.0 MPH or traveling between work areas at 20.0 MPH.

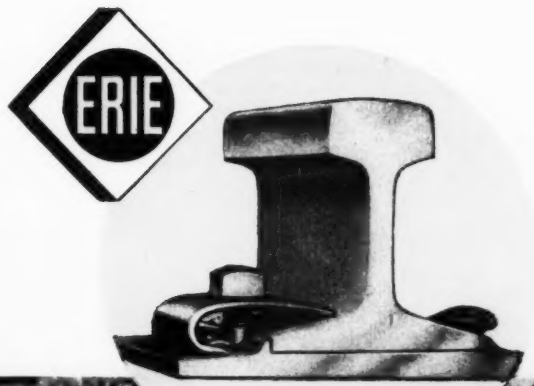
Oversize tires enable the HiLoader to maneuver over rails without damage. Regular train schedules need not be interrupted for track-cleaning crews. Weight is concentrated on the drive wheels for traction in soft-footing, cinders or snow. The conveyor is the right height for reaching into the highest hopper car or for casting material away from the tracks.

Make your track cleaning a one-man, one-machine operation with the Athey HiLoader Track Cleaner. Your Athey-Caterpillar Dealer can give you complete information or you can write direct to **ATHEY PRODUCTS CORPORATION, 5631 WEST 65TH STREET, CHICAGO 38, ILLINOIS.**

Tunnels in the cutting edge protect the rails, as the HiLoader does its work. The tunnels can be hooded for other types of loading tasks.

For additional information, use coupon, page 89

Compression ANCHORS PROTECT ERIE HIGH SPEED TURNOUT...



TYPICAL of Erie's pattern for *progress* is a new high speed turnout to expedite traffic in CTC territory at Otisville, N. Y. This is a No. 24 equilateral turnout with 39′ curved switch using Sec. 132 RE rail.

Compression *two-way holding* protects the efficient operation of this switch keeping the adjustment intact and preventing running and batter of the switch point. Compression Anchors eliminate binding of the front rod and link rod twisting which could eventually foul the slide bar.

A modern remote-controlled Rail-Tel propane switch heater keeps this switch free from the hazards of snow and ice.

THE RAILS COMPANY HOBOKEN · NEW HAVEN · CHICAGO · ST. LOUIS

One of the 160 Uses of CONCRETE on Railroads

NO. 18 OF A SERIES

Concrete coaling towers such as this one in the Norfolk & Western Railway's Broadway Yard in Petersburg, Va., are long-lasting improvements that facilitate speedy and economical service with little or no annual outlay for maintenance.

Concrete coaling towers are just one of more than 160 uses for portland cement and concrete which enable American railroads to improve service and save time and money. The moderate first cost of such concrete improvements — plus their long life and low maintenance cost — result in ***low annual cost.*** This saves money for other necessary budget items.

PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

RUST-OLEUM

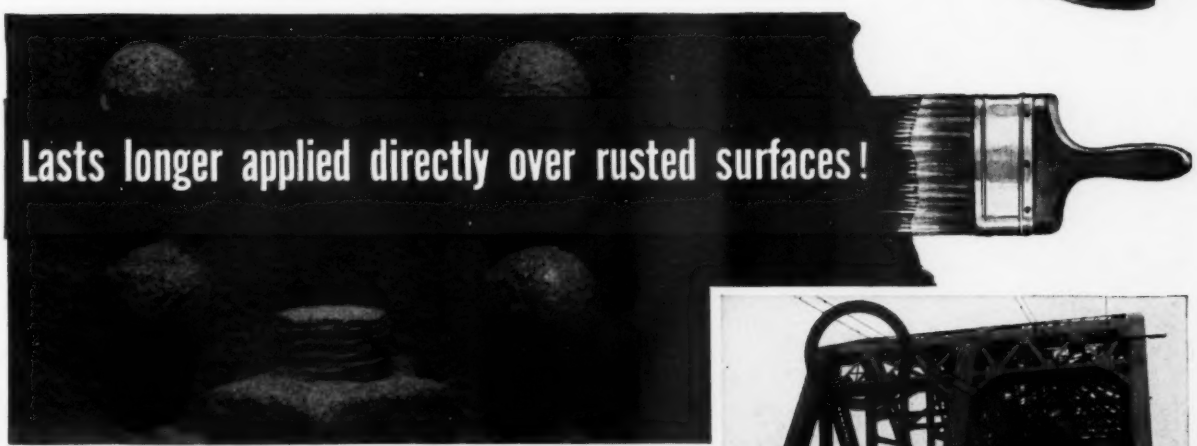
STOPS RUST!

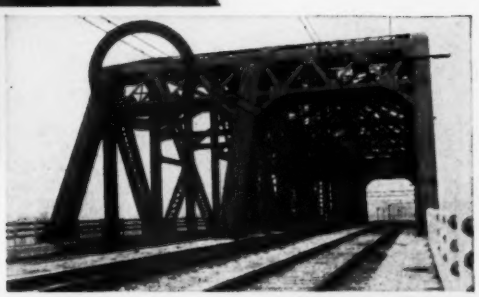
Cut Your Maintenance Costs On Signalling Equipment, Rolling Stock, Bridges, Towers, Tanks, etc.

Here's the *practical, sensible* answer to your rust problems! Costly sandblasting or chemical precleaning are not usually required . . . just wirebrush and scrape to remove rust scale and loose particles . . . then apply RUST-OLEUM by brush, dip, or spray over the rusted surface. Dries to a tough, elastic, rust-resisting film that lasts longer applied over rusted areas. So easy to use that one man often does the work of two . . . saves you time, labor, and money. Get the complete story from your RUST-OLEUM Rust Preventive Railroad Specialist today!

RUST-OLEUM CORPORATION
2548 Oakton Street, Evanston, Ill.

Available In All Colors, Aluminum and White





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DEMOUNTABLE STEEL WHEELS FOR EVERY TRACK CAR

Every Fairbanks-Morse demountable steel wheel conforms to one standard of quality — the highest!

Every step from sheet steel purchase to finished wheel is under Fairbanks-Morse control and inspection. Every wheel is cold-formed in our own plant, on our own presses using our own modern dies . . . machined and finished to a design of simplicity and strength.

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When you need replacement wheels in 20", 16" or 14" sizes, standardize on quality . . . standardize on Fairbanks-Morse steel wheels for longer life. Fairbanks, Morse & Co., Chicago 5, Ill.

Conform strictly to A.R.E.A. standards

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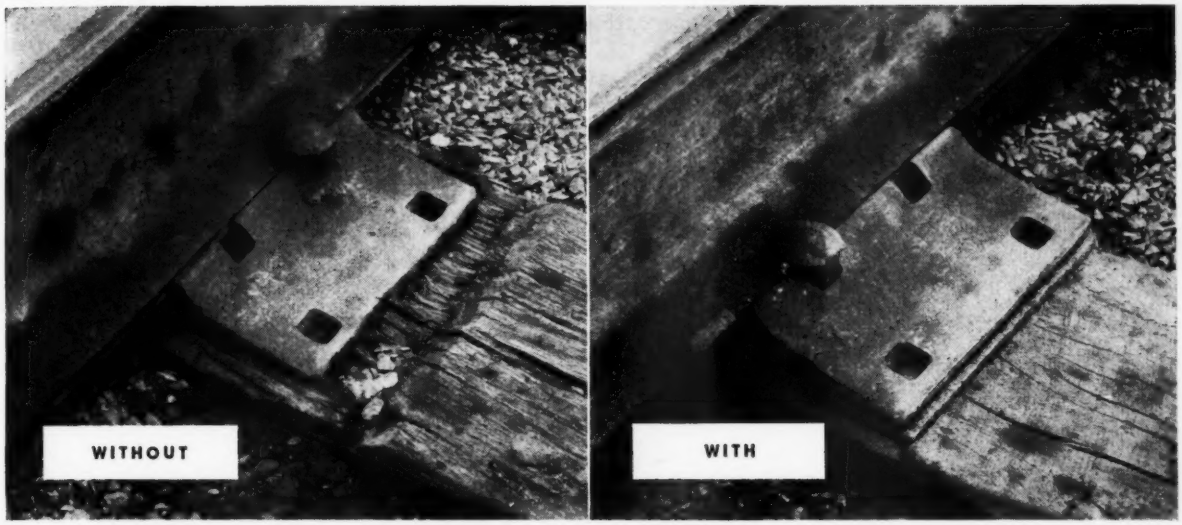
RAIL CARS AND RAILROAD EQUIPMENT • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • SCALES • WATER SERVICE EQUIPMENT • HAMMER MILLS • MAGNETOS



1 **Lengthen crosstie life**—By cushioning the tremendous shock of impact, eliminating tie abrasion and cutting action, the Burkart Tie Pad is successfully proving to be the most effective, most economical prolonger of crosstie life on the market today. Combining the toughest available structural fibre and a tough, abrasion- and shear-resistant high density binder, fused under great pressure, into a dense, rugged mat, the Burkart Tie Pad permanently protects the tie against destruction under the tie plate.

Strong and resilient, the Burkart Tie Pad constantly maintains full bearing strength and density, does not become brittle in severest cold, does not flow in extreme heat, seals against grit, resists moisture and preserves the vital tie area from fungus, brine, weed sprays, oil, vermin, etc., commonly found along the right-of-way.

Why M/W Engineers are choosing Burkart Tie Pads

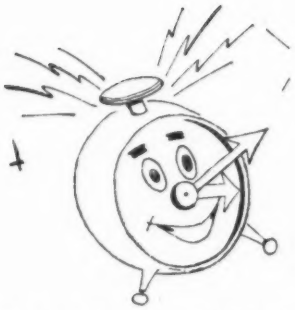
2 **Forestall Secondary Track Problems**—Rail end batter, spike loosening, regauging and reballasting are materially reduced by the Burkart Tie Pad. Its grasping action prevents shifting of the pad, and spikes hold. Joint bars remain tight. Its shock-absorbing resiliency protects against destructive movement, "rail wave" and drifting of ballast.

3 **Reduce Maintenance and Replacement Cost**—Labor costs money—when you invest in Burkart Tie Pads, you save on labor and materials involved in *replacement* of ties; *resetting* of spikes; *tightening* of joint bars; tie *tamping* and *regauging*. These are substantial, traceable dividends that will show up in black ink on *your* railroad's Financial Statement.

SEE FOR YOURSELF how rugged Burkart Tie Pads can save you money. Test them at trouble spots on your railroad—on bridge ties and at switches and curves, even on your straightaways. Send for sample, prices or additional information. If you wish, an experienced Burkart technical representative will gladly consult with you.

F. BURKART MFG. CO., Railroad Tie Pad Division
Division of Textron, Inc.
4900 North 2nd Street • St. Louis 7, Mo.

THE BURKART TIE PAD
with or without adhesive



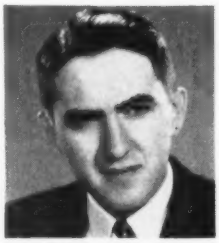
IT'S TIME TO COMPARE
TRACK MAINTENANCE
METHODS AND RESULTS

The swing to modern railroad equipment and faster schedules has put a new spotlight on track maintenance.

Millions of dollars have been spent by the railroads to better serve the country's transportation needs. In the drive for greater revenue, new, more economical motive power and cars of many types are rapidly replacing outmoded, uneconomical rolling stock.

Under today's operating conditions, more and more railroad managements are turning their attention to what is *under* the rails in addition to what rides *on* them. That is why it is wise to compare track maintenance methods and equipment right now. Why it will pay to find out *all* about the Pullman-Standard Power Track Maintenance Equipment shown on the next page.

T. Y. GEHR, Manager
Pullman-Standard Track
Equipment Department



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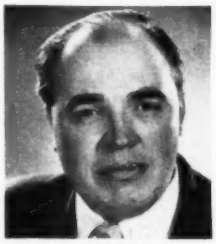

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These Men Have FACTS For You

Find out now why Pullman-Standard Track Maintenance Equipment has been able to establish new records for speed and economy.

Look over the engineering and construction details of this Power Track Maintenance Equipment and see why maintenance costs are so low.

Compare the P-S Power Ballaster, Power Cribber or Power Cleaner with any other available equipment and see why, mile after mile and year after year, these Pullman-Standard built units can assure better, faster, lower cost track maintenance. A Pullman-Standard representative will be glad to give you *all* the facts.

YOUR NEEDS CREATE THE PULLMAN "STANDARD"

PULLMAN-STANDARD

CAR MANUFACTURING COMPANY

SUBSIDIARY OF PULLMAN INCORPORATED

79 EAST ADAMS STREET, CHICAGO 3, ILLINOIS

BIRMINGHAM, PITTSBURGH, NEW YORK, SAN FRANCISCO, WASHINGTON

PULLMAN-STANDARD

Power Ballaster

With a production rate of 500 to 700 feet an hour, a Pullman-Standard Power Ballaster, run by a single operator, can be efficiently manned by a crew of 10 to 15 men. Case history studies made on 14 railroads prove that this unit will give more feet of finished tamped track per hour, with less labor and maintenance, than any other production tamper.

PULLMAN-STANDARD

Power Cleaner

and Winch Car Team

For the first time both track shoulders can be cleaned simultaneously at 1000 to 1200 feet per hour with only four men. Even in multiple track territory, the shoulder plus half the six-foot are cleaned to a depth of eight to ten inches below the tie base at the same high rate and with the same low labor complement. Your ballast cleaning costs can be reduced by as much as 50%.

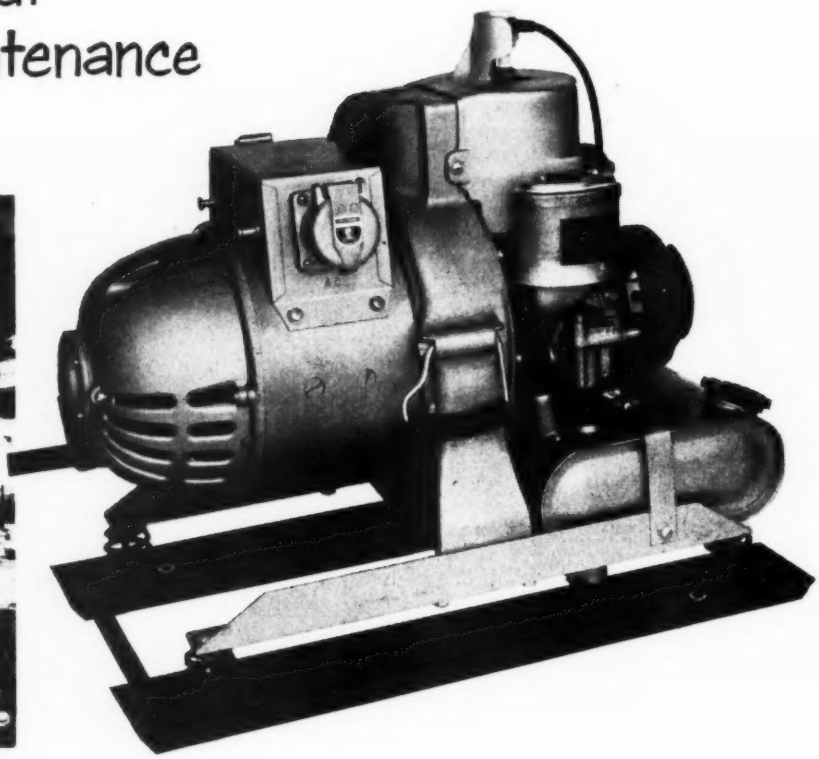
PULLMAN-STANDARD

Power Cribber

The Pullman-Standard Power Track Cribber gives you two cribs a minute, with a single operator. With a normal production rate of 100 to 225 track-feet per hour, its interchangeable 4-, 5-, and 6-inch digger tips enable it to crib efficiently and economically in any type of ballast, regardless of cementation.

Are You in an Economy Mood?

SEE HOW HOMELITE Dual Purpose GENERATORS Can Cut Your Maintenance Costs



The fastest, lightest weight, easiest-to-handle tools that money can buy today are high cycle power tools. They save time, labor, *money* every time they're used. And with a Homelite Carryable Dual Purpose Generator, you can use these labor-saving, money-saving power tools anyplace on your road.

What's more, with a Homelite Dual Purpose Generator you're not limited to high cycle operations. You can still use your good standard universal power tools or operate your floodlights. For a Homelite gives you *both* high cycle and standard power . . . both from the same generator.

So if you're in an economy mood, make the most of power tool savings . . . high cycle and standard . . . both operated by one Homelite Generator.

Write for a free demonstration.

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PERFORMANCE · DEPENDABILITY · SERVICE

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204 RIVERDALE AVENUE • PORT CHESTER, N. Y.

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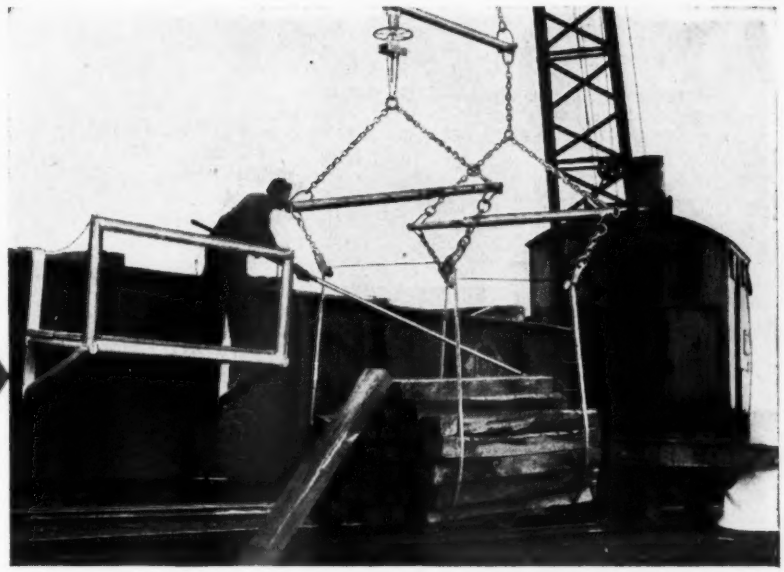
For additional information, use coupon, page 89

How Brainard can help you cut tie-handling costs

LOADING—Tram loads of ties, strapped with two special bands of Brainard steel strapping, are lifted quickly from ground stock into loading car. These unit tram loads, prepared at the tie-treating plant, speed stocking and loading.



DISTRIBUTING—Man on catwalk drops ties one at a time from moving car. Ties drop parallel to track. On one railroad, a four-man crew using the Brainard system has replaced a 17-man crew required for manual handling.

BRAINARD'S new system of tie handling is now in use on seven major roads, where it is cutting costs up to 30%. Plans for the special patented lift are available free of charge to railroads and tie-treating plants for production in their own shops.

Call your local Brainard salesman now—for a study of your operations and recommendations. District offices located throughout the U. S.

COMPLETE STEEL STRAPPING SYSTEM, ENGINEERING, STEEL STRAPPING, TOOLS AND ACCESSORIES, ANTI-CHECKING IRONS

For booklet write Brainard Steel Division, Sharon Steel Corp., Dept. S-4, Griswold Street, Warren, Ohio.

Brainard
SHARONSTEEL
STEEL DIVISION
SHARON STEEL CORPORATION
WARREN, OHIO

More Elbow Room for the ACL

GOING GREAT IN THE SAND—The ACL wants more room for spur and storage tracks at Smith Creek Yard and gets it in a hurry with two top-performing TD-18As on the job.

FOREMAN-OPERATOR climbed down from his TD-18A long enough to tell us he thinks they're tops. Here's why: *"INTERNATIONALS have the power to self-load scrapers and they can be maneuvered in almost any tight spot we encounter."*

Pair of INTERNATIONAL TD-18As power expansion of Atlantic Coast Line's Smith Creek Yard

When the Atlantic Coast Line needed more room for spur and storage tracks at its Smith Creek Yard at Wilmington, North Carolina, two INTERNATIONAL TD-18A crawlers did all the ground work.

A foreman, who also operates one of the crawlers, puts it this way:

"We work in all types of soil in this railroad construction and the TD-18A is one of the best crawlers for moving dirt fast. We've worked in sand for eleven months straight and we've had very low maintenance."

This story is repeated the country over. INTERNATIONAL crawlers deliver maximum power at minimum operating cost—day in, day out—on any kind of ground.

These rugged red crawlers will give you the same top performance. See them in action. All you have to do is ask your nearby INTERNATIONAL Industrial Distributor for a demonstration—on your own job—of "power that pays."

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

POWER THAT PAYS

INTERNATIONAL

INTERNATIONAL HARVESTER

For everything in Earthmoving

ON TRACKS ...ON RUBBER

See INTERNATIONAL'S Complete Earthmoving Line

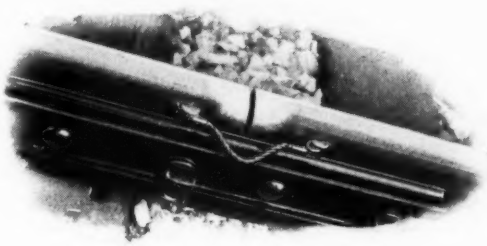
WHAT ARE YOUR REQUIREMENTS FOR END-HARDENED RAIL

Adequate Hardness?

Desired Toughness?

Correct Hardness Pattern?

Best Depth of Hardness?



You get all these with OXWELD'S *methods for oxy-acetylene rail-end hardening*

OXWELD'S methods of flame-hardening are backed by 15 years of experience. During that time millions of rail ends have been treated by this tried-and-tested method.

On many railroads it is standard practice to flame-harden rail ends as new steel is laid. This results in considerable savings because additional flagmen are not required and as the signal bonds are not in place it is not necessary to protect them. On other railroads the manual baffle box method has proved to be efficient, especially for small programs.

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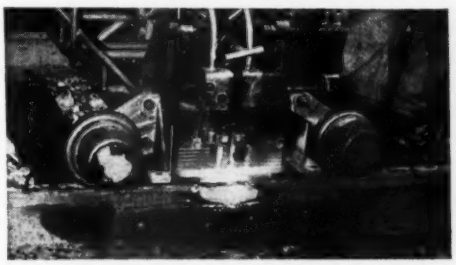
Manual baffle box method of end-hardening is useful in places where traffic is dense.



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No. 304 of a series

RAILWAY TRACK and STRUCTURES

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 WEST MONROE STREET
CHICAGO 3, ILL.

March 22, 1954

Subject: An Encouraging Sign

Dear Readers:

Elsewhere in this issue you will find a story, liberally illustrated with candid photographs, on the AREA convention held during the week of March 15 at Chicago. Our story does not purport to cover the proceedings in detail; in the space available all we can hope to do is to touch upon some of the high spots. But even if we could devote the entire book to this one meeting it would still be impossible to convey to you any more than a faint inkling of the fine spirit of aggressive enterprise that was in evidence on every hand in and about the meeting room. To me the prevalence of this spirit was the most heartening and significant aspect of the meeting.

To us as editors such conventions provide excellent opportunities to contact our railroad friends from far corners of the country and to find out what they are thinking and doing that might be of interest to others. These contacts are always pleasant and stimulating. One of their main purposes is to develop ideas and leads for feature articles. To my way of thinking the number of leads I jot down affords a rough measure not only of general activity in our field but of the aggressiveness with which advanced practices are being devised and put to use.

As time passed during the convention it became increasingly apparent that an unusually large number of items were going into my notebook, most of them having reference to new, better and cheaper ways of doing maintenance work. This was gratifying for two reasons. First, it meant that we would soon be harvesting an abundant crop of interesting articles for the magazine. Second, it was evidence to me that maintenance men are more active than ever in developing cost-saving practices. This is important because it is only through such activity that true economies in property maintenance can be realized, in contrast, that is, to reductions in expenses achieved simply by reducing the amount of work done.

There were other manifestations at the meeting of the spirit I have mentioned. It was evidenced by the unusually good attendance in the convention hall, by the earnest and animated nature of conversations overheard in the foyer and elsewhere, and finally by the surprisingly large registration in a non-exhibit year. There is no doubt that maintenance men are rising to the challenge created by present business conditions, and that they will be equal to it.

Yours sincerely,

Merwin H. Dick

Editor

MHD:lw

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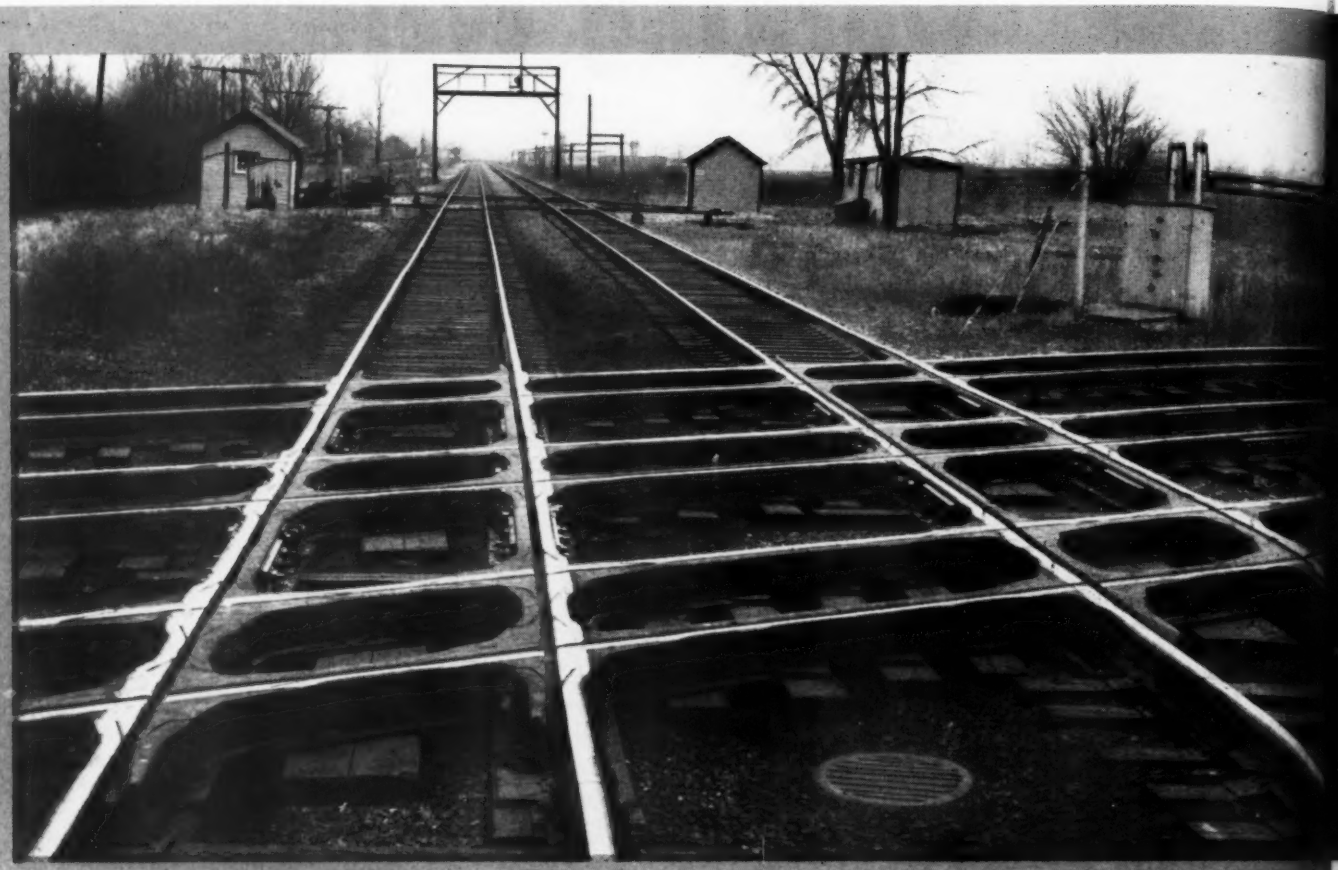

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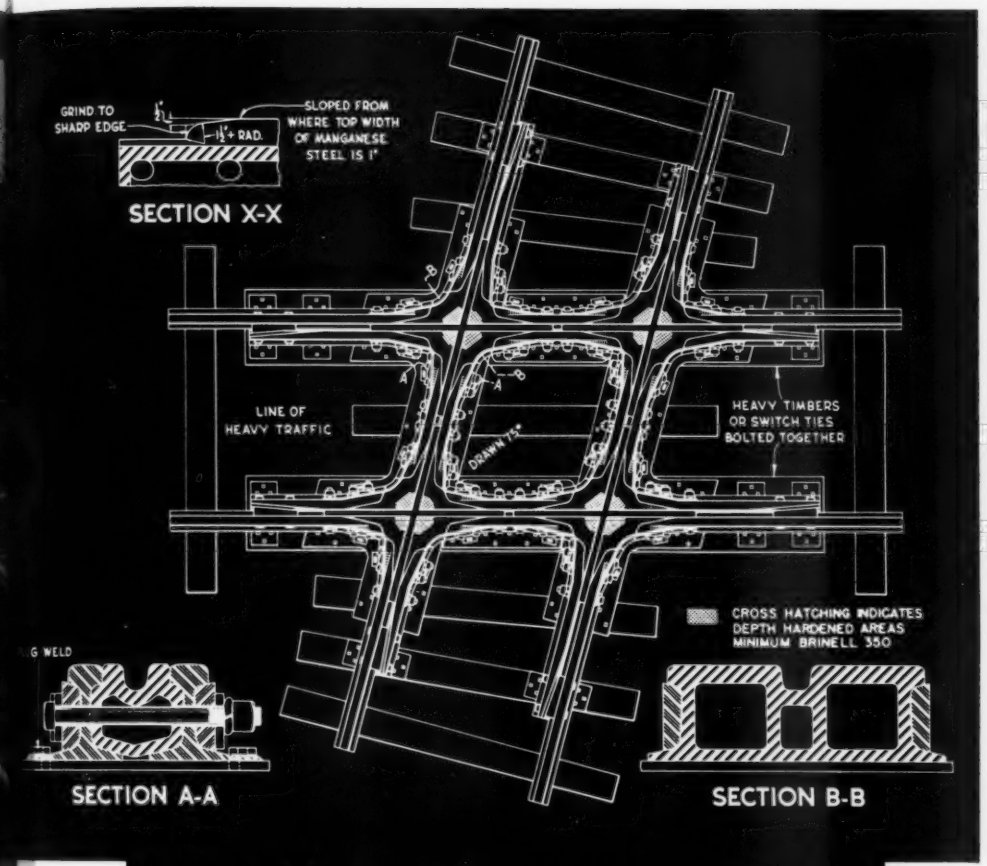
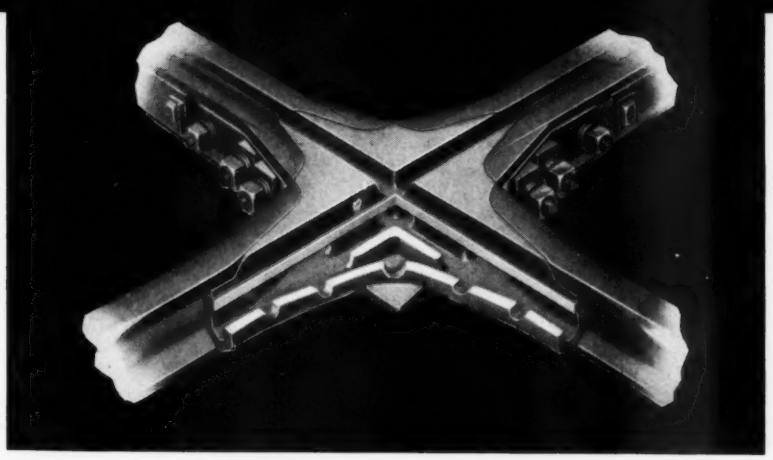
el Crossings SINCE 1936


GRIND TO SHARP EDGE
SLOPED FROM WHERE TOP WIDTH OF MANGANESE STEEL IS 1"
1½" RAD.
SECTION X-X
LINE OF HEAVY TRAFFIC
HEAVY TIMBERS OR SWITCH TIES BOLTED TOGETHER
DRAWN TO
CROSS HATCHING INDICATES DEPTH HARDENED AREAS MINIMUM BRINELL 350
G WELD
SECTION A-A
SECTION B-B



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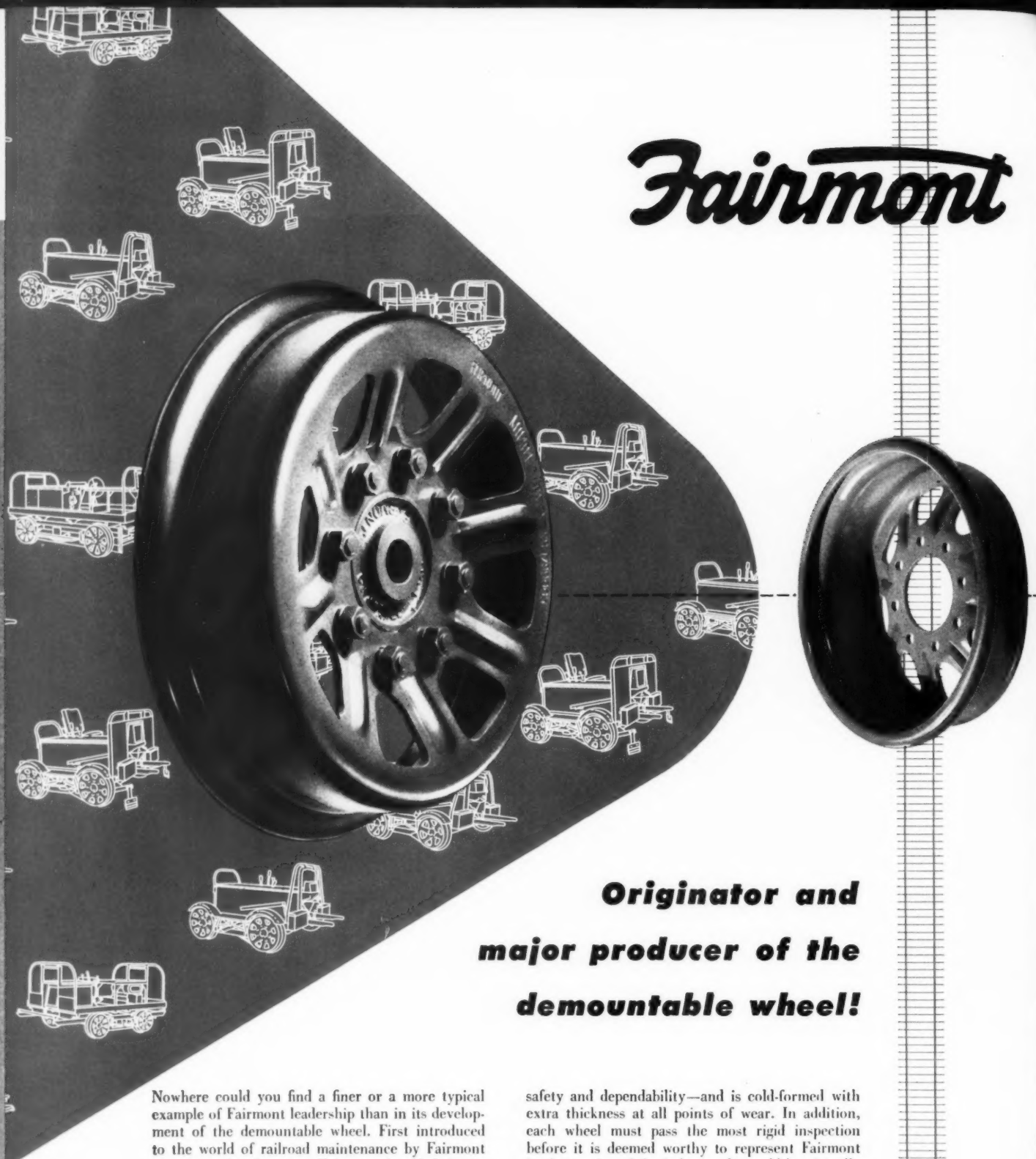

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Published on the first day of each month by the

SIMMONS-BOARDMAN PUBLISHING CORPORATION

79 West Monroe St., Chicago 3

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New York 7,
30 Church Street

Washington, D. C., 4
1081 National Press Bldg.

Cleveland 13,
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Portland 5,
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San Francisco 11,
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Subscription price to railroad employees only in the U.S., U.S. possessions and Canada, $1.50 one year, $2 two years, payable in advance and postage free. Subscription price to railroad employees elsewhere in the Western Hemisphere, $5 one year, $10 two years. All other countries, $7 one year, $14 two years. Single copies 50¢. Address correspondence concerning subscriptions to Robert G. Lewis, Assistant to President, 30 Church Street, New York 7.

Member of the Associated Business Papers (A.B.P.) and of the Audit Bureau of Circulations (A.B.C.), and is indexed by Engineering Index, Inc.

PRINTED IN U.S.A.

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Schools for M/W Mechanics

When work programs are prepared for track maintenance, the rate of progress of each gang is judged by the past performance of similar gangs. Due consideration also is given to additions or other changes in the types of mechanical equipment to be used by the gang, and to changes to be made in the organization and the number of men employed. Allowance is also made for inclement weather. Rarely is an allowance made for "down-time" of the mechanical equipment for repairs, the theory being that local work-equipment mechanics will keep the machines in good condition.

But, is that entirely fair to these men? Can they keep informed on the operation and maintenance of all the equipment that is acquired by their railroads, especially the larger and more complicated machines?

Although many manufacturers of railway equipment have service men who are available for instructing operators and mechanics on the operation and care of their machines, it obviously is impossible for them to follow all units as they are moved about on the railroads. As a result, some of the operators and mechanics are not adequately informed.

From where we sit, it seems that one of the best ways to keep all work-equipment mechanics enlightened is to follow suggestions made by the Committee on Maintenance of Way Work Equipment at the March meeting of the AREA. This committee suggested that manufacturers of maintenance-of-way work equipment provide schools for training the mechanics and supervisors, with the railroads supporting such schools and having their mechanics attend them. Where factory schools are impracticable, the committee would have the manufacturer send a qualified representative to conduct schools at certain centrally located points designated by the railroads.

Don't Forget the Section Man

We digest with relish the sagas of the air force and the mechanized army in the victories of war. But who consolidates and holds their gains? None other than the slogging infantry.

We look avidly for the latest report on the achievements of the modern highly mechanized, high-production specialized system gangs whose work in producing better track has daily assumed greater and greater importance. We view with interest the organization and equipment of the highly mobile district gangs which are able to concentrate on important work in their own permanent territories.

Has the lot of the section gang—the infantry of the maintenance department—been forgotten? They are the men who hold the line and take the rap for rough track and carry the load between the visits of the glamour gangs.

Section gangs, in the "new look" of the maintenance department of most railroads, have been drastically reduced in size. Their territories have in general been greatly lengthened. They have in some cases been relieved, to a large measure, of the track inspections which they previously had been required to make. There are, however, many important duties still falling to their lot. These include the thousand and one chores that continually arise on their territories. What has been done to increase the efficiency of these men by providing them with mechanized equipment to increase their productivity?

There is a challenge to produce and supply easily portable tools which can be efficiently used by one or two men, the usual size of many of these gangs. Some strides have been made in this direction but much must still be done if we are to achieve complete mechanization of our railway maintenance.

Large Attendance at AREA Convention

Fifty-third annual meeting of association was held at Chicago last month. Addresses emphasized how changing traffic patterns are altering role of the engineering and maintenance officer.

Convention Pictures

One of the advantages of attendance at the AREA convention is the opportunity it affords for renewing old acquaintances, making new ones and "talking shop." The candid pictures shown on these and the following pages are ample evidence that this opportunity is not neglected.

Railway engineering and maintenance officers had their "day" during the third week in March when the American Railway Engineering Association held its fifty-third annual convention. This meeting, held at the Palmer House, Chicago, attracted a total of 2,067 persons, including 1160 members of the association and 907 guests. This attendance was considerably higher than the figure reached at the 1953 convention.

The program of the three-day meeting was, as usual, devoted largely to the presentation and consideration of reports prepared by the association's 22 standing committees and its one special committee. These committees reported on approximately 115 individual assignments dealing with every conceivable type of problem being encountered in connection with the design, construction or maintenance of the railroad's fixed properties.

Other aspects of the technical sessions included the presentation

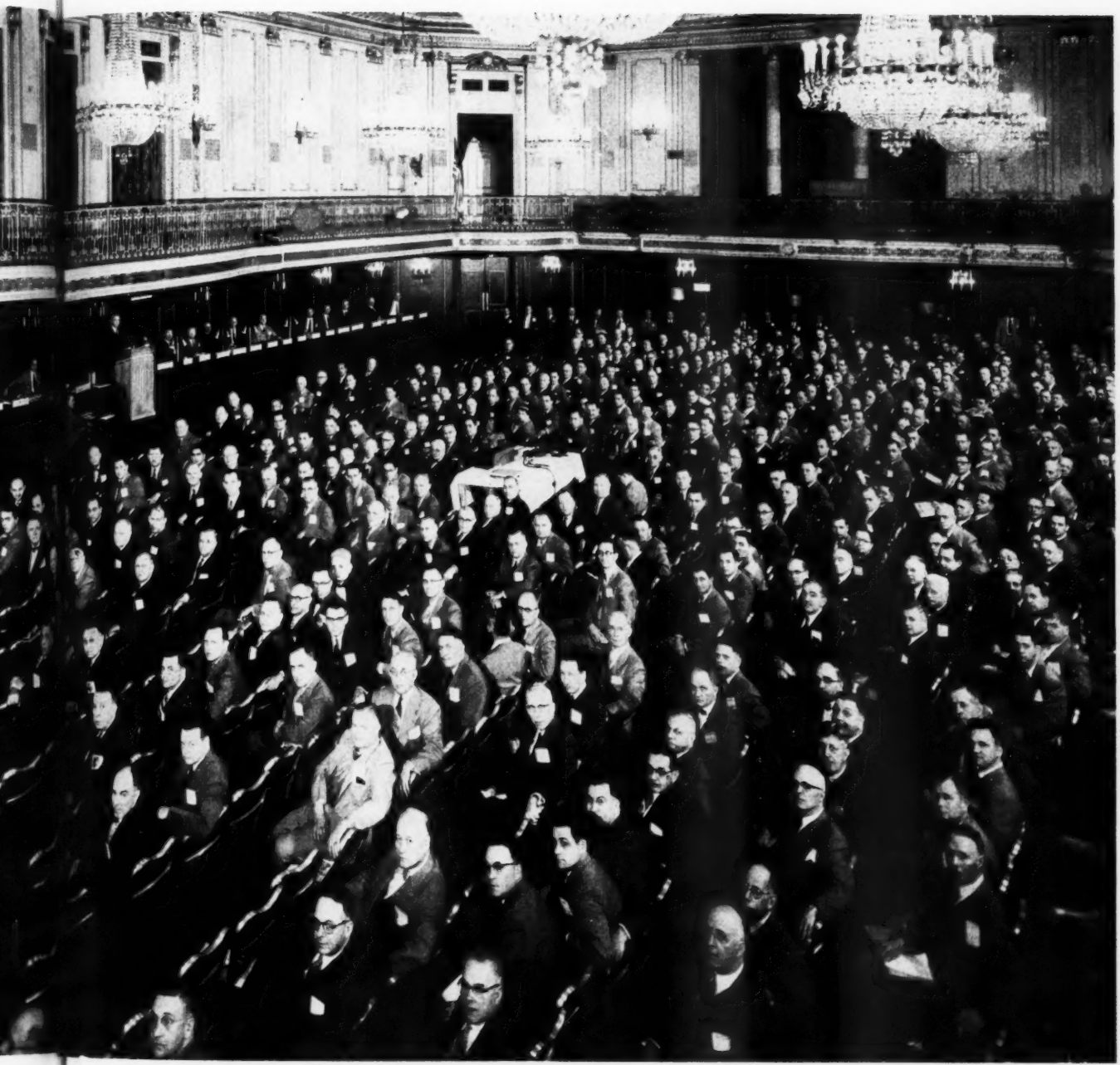
(*Continued on page 42*)

C. G. Grove, president of the AREA.

In the Grand Ballroom of the Palmer House during the opening session on March 16.

H. L. Holderman, Bird Tie Pads; S. H. Shepley, EJ&E; H. J. Seyton (ret.), GN; E. C. Vandenburgh (ret.), C&NW.

Charles Rager, Fairmont Railway Motors; J. R. Graham, Nordberg Mfg. Company; L. R. Lampart, C&NW.



R. A. Emerson, CPR, presents gavel to new AREA president, G. W. Miller.

R. N. Schmidt, Carter-Waters; H. M. Booth, V. R. Copp, R. White, J. L. Deverell, J. H. Brown, E. L. Collette, G. L. Harris and D. L. Walker—all of the Frisco.

J. C. Jacobs and Lee W. Howard of the Illinois Central.

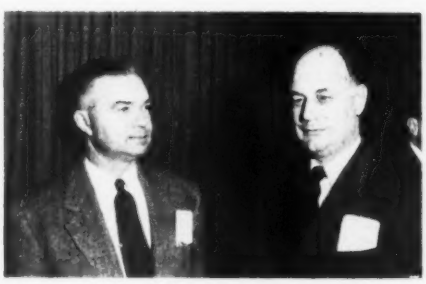
From the Illinois Central—E. A. Johnson, and M. Block.

G. W. Neal, Chattahocchee Valley; A. B. Chaney, Missouri Pacific.

From the Chicago & North Western System—C. J. Freseman; W. H. Huffman, P. V. Thelander, and M. S. Reid.

H. H. Morgan, R. W. Hunt Company; E. C. Bast, AT&SF; Ray McBrian, D&RGW; W. S. Boyce, CF&I; L. F. Bross, R. W. Hunt Company.

From the Central of Georgia—R. H. Gilkey and G. W. Benson.



H. W. Kellogg, Chesapeake & Ohio; M. S. Westlund, Electric Tamper & Equipment.

A. S. Krefting, Soo Line; S. P. Berg, DSS&A.

D. E. Perrine, Chicago & Western Indiana; K. J. Weir, W-M Corp.; G. K. French, Pennsylvania.

C. H. Wiggins and W. E. Bedinger of the Seaboard Air Line; W. A. Spell, Atlantic Coast Line.

of a number of addresses, several of which dealt with current research projects now being sponsored by AREA committees.

However, the program included some features of a non-technical nature, among them several addresses which dealt in a general way with the extent and manner in which changing times have altered the role and function of railway engineering and maintenance officers. One of these addresses was presented by R. G. May, vice-president, Operations and Maintenance department, Association of American Railroads; the other by J. M. Symes, executive vice-president, PRR. Although each of these speakers developed the theme in a different way, the gist of their remarks was that the enginer, rather than being merely a builder of new lines and other facilities to handle a growing volume of traffic, and to penetrate new territories, must concentrate his attention on adapting the railroads' fixed plant to changing patterns of traffic, while at the same time constantly exploring new ways of reducing the cost of maintaining this plant.

Another speaker, G. M. Magee, director of engineering research, Engineering Division, AAR, made a highlight report on developments in railroad research during the past year. Mr. Magee reported that a second building, for conducting

P. S. Settle, Railway Maintenance Corp.; G. A. Godley, Armco.

R. G. May, vice-president, AAR; C. B. Bronson, New York Central.

G. L. Burkart, F. Burkart Mfg. Company; B. R. Perkins, Missouri-Kansas-Texas.

J. E. Reese and H. W. Anderson, T. F. Scholes, Inc.; J. M. Fox, Pennsylvania.

W. H. Bunge, Missouri Pacific; Walter Liddell, Johns-Manville; D. E. Brunn, Toledo, Peoria & Western.

Edward Wise, Jr. and Claude Johnston, Louisville & Nashville.

T. L. Hendrix, Chesapeake & Ohio and K. L. Miner, New York Central.

R. G. Kensel, Continental Oil Company; B. J. Ornburn, Milwaukee Road.

Included in the Erie representation—R. H. Jordan, H. J. Woccheider, E. H. Ness, L. H. Jentoft.

P. E. Patterson, Lehigh Valley, and A. A. Cross, Bird Tie Pads.

mechanical research, has been completed at the association's Research Center at Chicago, and outlined a proposal for constructing a third building to be known as the engineering research laboratory.

Referring to the death on February 21 of W. C. Barnes, engineer of tests of the Engineering Division, Mr. Magee reviewed the development of equipment for detecting internal fissures in rails. The foresight of Mr. Barnes and that of the AREA Rail committee in sponsoring early research on the subject "are well exemplified by the tremendous benefits that are being realized from rail detector cars. In 1952, as reported by the Rail committee this year, there were over 30,000 transverse defects located in track by detector cars, permitting rail removal before service failure occurred. Detection and removal of these transverse defects has saved many lives and injuries and millions of dollars in expense due to property damage that would have occurred if these defects had remained in track and the rails broken in service."

All sessions of the convention were presided over by C. G. Grove, president of the association, and chief engineer, Western region, Pennsylvania, assisted by Vice-President G. W. Miller, engineer maintenance of way, Eastern re-

E. E. Crowley, Delaware & Hudson; E. L. Anderson, Frisco.

F. Norman, Cleveland Frog & Crossing; F. J. Bishop, AC&Y.

R. L. Fox, T. M. von Sprecken, R. E. von Sprecken—all of the Southern.

T. F. Burris, Chesapeake & Ohio; E. C. Vandenberg (ret.), C & NW; J. E. Winslow, Oxweld Railroad Service Company.

D. C. Hastings, J. R. Talbott, Jr., J. C. DeJarnette, Jr.—all of the Richmond, Fredericksburg & Potomac; G. P. Hayes, major, U.S.A.T.C.

M. H. Dick, Railway Track & Structures; L. F. Racine, Monon; C. E. Weller, Illinois Central.

C. H. Johnson, Fairmont Railway Motors, Inc.; Jack Thompson, Railway Track & Structures.

Randon Ferguson, Association of American Railroads; W. F. Cornell, Nickel Plate.

W. C. Hudson, Missouri Pacific; H. E. Wilson, R. H. Beeder, L. V. Lienhand—all of the Santa Fe.

gion, Canadian Pacific, and Secretary Neal D. Howard.

The following officers were elected; President, Mr. Miller, and vice-president to serve for two years, W. G. Hedley, assistant chief engineer, Wabash, St. Louis.

The directors elected are C. B. Porter, assistant chief engineer, Chesapeake & Ohio, Richmond, Va.; C. H. Sandberg, assistant bridge engineer-system, Atchison, Topeka, & Santa Fe, Chicago; W. H. Giles, assistant chief engineer-system-construction, Missouri Pacific, St. Louis; and H. R. Peterson, chief engineer, Northern Pacific, St. Paul, Minn. Members of the nominating committee are: T. M. von Sprecken, assistant to chief engineer, Southern, Washington, D. C.; F. A. Hess, assistant chief engineer, Lines West of Buffalo, New York Central, Chicago; R. H. Beeder, assistant chief engineer system, Atchison, Topeka & Santa Fe, Chicago; C. J. Code, assistant chief engineer-engineer of tests, Pennsylvania, Philadelphia; and G. L. P. Plow, assistant chief engineer, Canadian National, Montreal.

In addition, G. M. O'Rourke, assistant engineer maintenance of way, Illinois Central, Chicago, and vice-president of the association was automatically advanced to senior vice-president, succeeding Mr. Miller.

Special Techniques Permit Mississippi River Bridge to Stay in Service When . . .

Renewing Pins in Truss Spans

When some of the pins and the pin holes of members became worn in the road's through pin-connected truss bridge over the Mississippi river near Dubuque, Iowa, the holes were rebored and larger pins were installed. Special clamping arrangements for holding the members while reboring the holes made a temporary bridge unnecessary. The bridge work was done under traffic between trains.

By R. E. Dove
Associate Editor

● One of the larger bridge structures which the Illinois Central had been considering for some time for rehabilitation is W 182-0, a six-span through pin-connected truss bridge over the Mississippi river near Dubuque, Iowa. This structure has been and still is subjected to heavy usage, carrying the heaviest power of the IC on its line between Chicago, Omaha and Sioux City, the engines of the Chicago Great Western between Chicago and its terminals at Kansas City, Omaha and Minneapolis, and switch movements of the Chicago, Burlington & Quincy between Dubuque and East Dubuque, Ill. As a result of this heavy traffic and the age of the structure, some of the pins and the pin holes of bridge members had become worn from mechanical wear to the extent that major repairs were required to restore the structure to its original design condition. These repairs, consisting primarily of reboring certain holes and installing new pins, have now been completed and were made without the use of a temporary bridge and without taking the structure out of service except for brief periods.

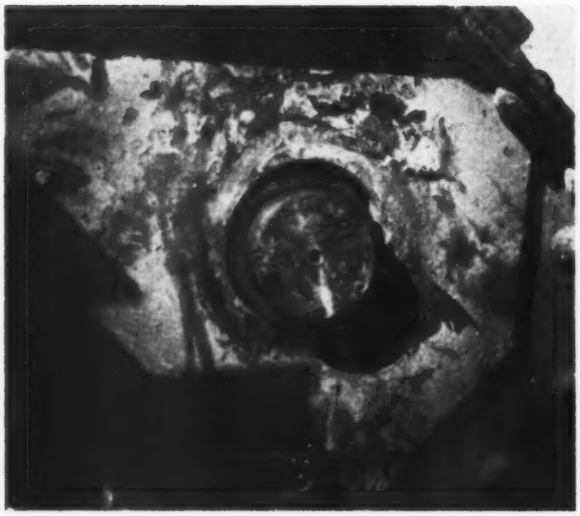
The bridge was originally constructed in 1868 and consists (see diagram) of three 225-ft. spans, two 250-ft. spans, and a swing span 360 ft. long having a center pivot pier, all supported by stone masonry piers and abutments on timber grillages founded on timber piles. The superstructure of the swing span was rebuilt in 1892 and the fixed spans in 1900. The original masonry is still being used; however, except for the pivot pier of the swing span, all the piers and abutments have been jacketed with concrete.

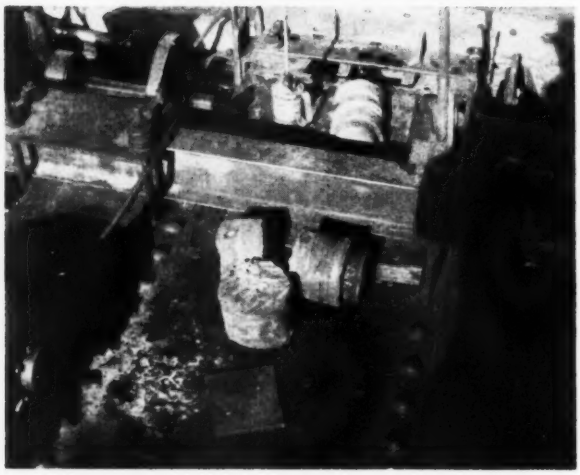
Thorough Investigation Made

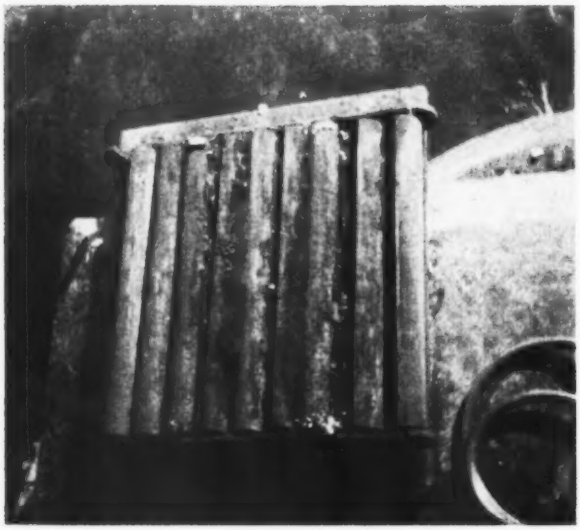
Several years ago, the bridge department of the IC made a careful field inspection of the structure and followed it up with a stress analysis, which led to the decision that the structure could not be carried along much longer in its present condition. To verify these findings, the firm of Modjeski & Masters, consulting engineers, Harrisburg, Pa., was employed to make an independent field inspection and stress analysis, and to advise how the structure could be restored to its original design condition.

Representatives of the consulting firm made their detailed inspection in June and July 1953 with the assistance of members of a steel repair crew of the railroad which was working on the structure at that

These Conditions of Wear . . .







ABOVE LEFT—With the nut removed, the reason for the loose eye-bars and uneven distribution of stresses become evident.

ABOVE RT.—Worn pins were found to be grooved, some so deeply that they had to be torch-cut before they could be removed.

LEFT—Roller nests were found inoperative because of corrosion so all expansion bearings were replaced with new assemblies.

time. The inspection revealed that the spans for the most part were in fair condition, thanks to numerous repair programs in the past. These had included the replacement of parts, especially in the floor system where corrosion due to brine action had reduced sections in stringers and floor beams, and also in the overhead bracing where engine blasts had caused a reduction of section in the members. The inspection also showed that there had been no loss of section in the main truss members and that these required no repairs except as necessary to tighten eye-bars and to repair some truss connections.

However, it was found that there was a general condition of loose eye-bars in each span, precluding an even distribution of the stresses in the multiple eye-bar members. The inspection also revealed that considerable wear of some of the pins had taken place, a condition that tended to cause an unbalanced distribution of stresses. This condition was especially noticeable at the ends of the swing span and at the centers of the two 250-ft. fixed spans where reversals of stress occur. The roller-type expansion shoes were also found inoperative because of bad rusting conditions which to some extent prevented normal movement of the spans.

An analysis of stresses made at the time of the detailed inspection showed that the original design of the principal truss members was entirely adequate to carry heavy locomotives, with relatively few members stressed above basic design unit stresses and all of them safely within allowable operating stresses.

The inspection further revealed that the unit stresses and materials employed in the design and construction of the superstructure were such as to permit rehabilitation of the structure for modern loads, and that the material in all members at pin connections was sufficiently large to permit reboring operations for larger-sized pins where excessive pin wear had occurred.

Proposed Bridge Repairs

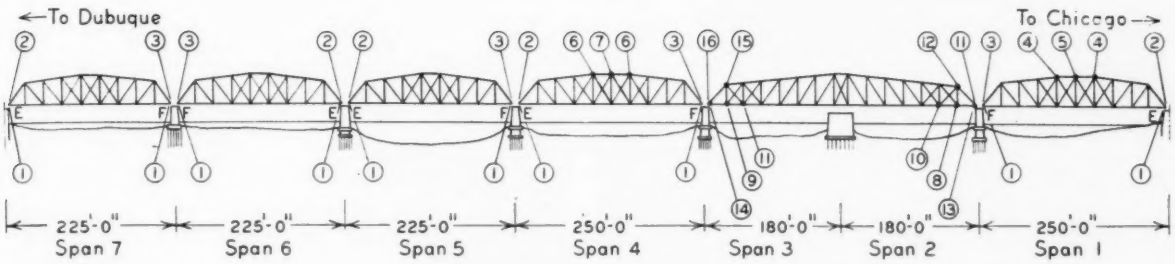
On the basis of the inspection it was agreed that, if the worn pin holes were rebored and larger-sized pins installed, the looseness in the affected diagonal and vertical members would be corrected, thus enabling these trusses to serve for an extended period of time.

For the swing span, it was decided to replace 16 of the worn pins at the ends with larger pins, these being located at the L0, L1, L2 and U1 points.* It was also decided that the adjustments and replacements in the swing span be made in such a manner that upon completion there would be sufficient deflection at the ends to permit normal jacking for obtaining a positive reaction on the piers when the span was closed, which required that the toggle uplift shoes and adjoining fixed span shoes be shimmed higher off the rest piers.

In the case of the fixed spans, it was decided that the roller bear-

*This method of designating panel points is in accordance with standard practice used by bridge engineers. The letters "L" and "U" refer to points in the lower and upper chords, respectively. Thus "LO" is the end panel point in the lower chord and "L1" is the first panel point from the end. Likewise, "U4" is the fourth panel point in the upper chord from the end of the span and "U4'" is the fourth panel point in the upper chord counting from the opposite or "prime" end of the span.

. . . at Chord Points and Bearings Were Corrected Using This Procedure . . .



WORK OF REHABILITATION was carried out over a period of 11 weeks without removing the bridge from service except for short periods of time. The work and procedure (see numbers on above diagram) were as follows:

(1)—Reinforce the end floor beams on all fixed spans to permit jacking up spans.
(2)—Jack up the fixed spans at the expansion ends, renew the roller nests and masonry plates, remove pulverized stone at bearings, stub anchor bolts, and level masonry plates with Rust-Joint Iron grout.
(3)—Jack up the fixed spans at the fixed ends, straighten and reset fixed shoes, clean masonry plates and level with Rust-Joint Iron grout.
(4)—Erect scaffolds at U4 and U4′ points of span No. 1, install temporary holding material, remove existing 5-in. pins, rebore pin holes, and install new 5¼-in. pins.
(5)—Erect scaffolds at U5 points of span No. 1, install temporary holding material, remove existing 5-in. pins, rebore pin holes, and install new 5 5/16-in. pin on downstream side and 5½-in. pin on upstream side in place of the 5-in. ones.
(6)—Erect scaffolds at U4 and U4′ points of span No. 4, install temporary holding material, remove existing 5-in. pins, rebore pin holes, and install new 5½-in. pins.
(7)—Erect scaffolds at U5 points of span No. 4, install temporary holding material, remove existing 5-in. pins, rebore pin holes, and install new 5½-in. pins.
(8)—Install temporary holding material at L1 points of span No. 2, set up jacks and blocking on upstream and downstream ends of island fender of pivot pier, turn swing span and jack up, remove existing 5⅞-in. pins from L1 points of span No. 2, rebore pin holes, renew filling rings, and install new 6 31/64-in. pins.
(9)—Install temporary holding material at L1 points of span No. 3, turn swing span and jack up on blocking, remove existing 5⅞-in. pins from L1 points of span No. 3, rebore pin holes, renew filling rings, and install new 6½-in. pins.
(10)—Install temporary holding material at L2 points of span No. 2, move jacks and blocking on upstream fender to conform, turn swing span and jack up span, remove existing 6⅛-in. pins from L2 points of span No. 2, rebore pin holes, renew filling rings, and install new 6¾-in. pins.
(11)—Same procedure as Item 10 for L2 points of span No. 3.
(12)—Erect scaffolds at U1 points of span No. 2, install temporary holding material, remove existing 5⅞-in. pins, rebore pin holes, and install new 7-in. pins.
(13)—Install temporary holding material at L0 points of span No. 2, jack up span, remove existing 5⅞-in. pins, rebore pin holes, and install new 6½-in. pins.
(14)—Same procedure as Item 13 for the L0 points of span No. 3.
(15)—Same procedure as Item 12 for the U1 points of span No. 3.
(16)—Adjust end wedges as necessary to compensate slightly for end uplift.
(17)—Adjust turnbuckles of eye-bars in all spans.

ings under the expansion ends of all spans should be renewed to relieve locked-in stresses, and the fixed shoes leveled and reset; that the end floor beams of these spans be reinforced for jacking operations; that the present worn pins at the U4, U5 and U4′ bars be tightened.

Bridge Kept in Service

The plan of procedure called for the work to be done without taking the bridge out of service except for short periods of time. The pin-changing work was originally planned to be done on Sundays, when the normal traffic density is low, permitting 10 hr. of uninterrupted work on the bridge. The remainder of the week would be used to prepare the blocks and connections to the various members around the joints to permit reboring the pin holes.

With no live load on the bridge while the pins were removed and the holes were being bored, the stresses in the diagonals and posts were relatively small. Hence, plans were projected to do the work without the use of a temporary bridge and with the various members concentric to each pin being held in position by a temporary clamping arrangement.

Work was started on August 20, 1953, and was done under contract by the American Bridge Division, U.S. Steel Corporation, Chicago. Beginning with a superintendent, a timekeeper, and 8 men, the crews were later expanded to as high as three crews totaling 26 men. The railroad was represented by one of the engineering consultants and by a railroad bridge inspector, the latter to arrange with the operating department for the clearance of trains.

The first construction work consisted of the reinforcing of the end floor beams of the fixed spans to permit the spans to be jacked up while changing out the expansion bearings and reseating the fixed bearings. This phase of the work included jacking up a span; removing the old roller nests and bottom masonry plates; cleaning the top and bottom masonry plates; cutting out the soft or deteriorated stone masonry; welding on stubs to the anchor bolts; resetting the bottom masonry plates to proper line and elevation, using Rust-Joint Iron grout; setting the new roller nests, which were adjusted for temperature, into position; and lowering the span. The procedure for rehabilitating the fixed bearings was similar except that the old bearings were cleaned and reused. Since this work at each end of a span required only a little over an hour to complete, there was no delay to traffic.

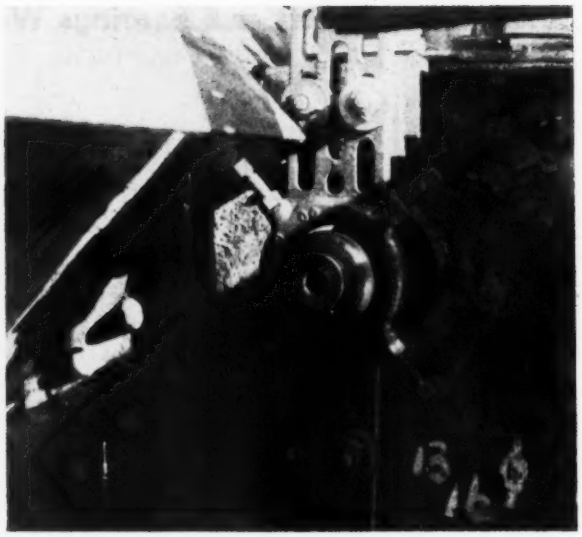
Replacing Pins in Upper Chords

The first work of changing out the pins was done on span No. 1 at points U4, U4′ and U5, in that sequence (see drawing). The contractor erected temporary scaffolds on the upstream and downstream sides of the U4 points as well as cable handrails along the top chords, then proceeded to prepare the connections of the truss members at these points for boring.

Some rivets were knocked out from the underside of the top chords on each side of the U4 points and prefabricated temporary gusset plates were riveted in place so as to engage the vertical post and the eye-bar diagonals. The bridge was closed to rail traffic while the gusset plates were being riveted. Rivets were knocked out

Steps in Boring Operation . . .

1 SPECIAL ARRANGEMENT was used to hold members in proper position to permit reboring of pin holes.



2 ACCURATE CENTERING of boring-tool shaft was accomplished by means of this special centering device.

of the post as necessary to permit it to be bolted to the temporary gusset plates, and clamping plates were applied to hold the diagonals to the gusset plates by bolting.

Stirrups were used at the lower ends of the U4-L5 diagonals and connected by a bar-and-turnbuckle arrangement to the temporary gusset plates, thus forming temporary U4-L5 diagonals for taking the dead load while the upper loops of the permanent eye-bars were adjusted to their proper position and bored. These temporary diagonals were left loose while the bridge carried rail traffic but were tightened later for boring operations. Crosshead mountings for an Underwood air-driven portable boring machine were bolted into their respective positions on the chord, and the major work preparatory to boring was completed at these points.

Boring First Hole Was Slow

On Sunday, September 6, after the usual heavy morning traffic had passed, the bridge was closed to traffic. The turnbuckles of the U4-L3 diagonals were loosened and the U4-L5 diagonals were tightened. It took over two hours to properly position all of the members coming into the U4 points, where they were bolted and tack-welded to spacer angles on the temporary gusset plates. When this was completed the pins came out easily.

The boring machines were positioned and worked simultaneously on both chords. The repair work called for the installation of 5½-in. pins to replace the existing 5-in. pins. It was planned to enlarge the existing holes in two passes of the cutting tools. For the first pass the cutting tools were set for a diameter of 5 9/32 in. However, before this pass was completed, the cutting tool of the upstream machine broke and the air motor failed. The motor was repaired and the tool replaced. But the boring by both machines proceeded so slowly that it was decided to turn the pins down at a local machine shop to the size of the holes after the first pass of the machines. The pin wear at both of these U4 points was small enough that this could be done and still have a complete new hole.

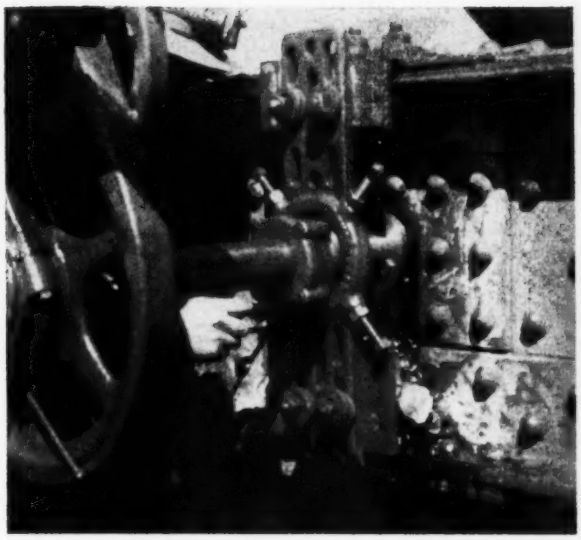
Though it was Sunday, a local machinist was located who cut the pins down to 5¼ in., after which they were installed. Obviously, this change from plan required more time than had been anticipated with the result that the bridge was not restored to service until after a lapse of about 14 hr. Because of the uncertainties of using air motors, the contractor obtained two 2-hp. electric motors, and the railroad's electricians connected them to the power source. Thereafter, the holes were bored much faster; although as many as five passes were required for installing some pins, the time required for this work was substantially reduced.

All the old pins that were renewed in the upper chords of spans No. 1 and No. 4 were removed without difficulty, except one on the upstream side at the U4 point of span No. 4 which, despite the use of penetrating oil and shaking the members, failed to come loose and had to be burned out. Although it was originally the plan to install new 5½-in. pins at these points, all but one pin for span No. 1 was turned down to a smaller diameter, but all pins on span No. 4 were of the 5½-in. size.

The preparatory work generally was being carried out at four pin connections at one time. For instance, while the upstream and downstream U4 connections were being prepared on span No. 1, the two points at U4′ were also being made ready. Then while the U4 points were being bored, the U5 points were being made ready and the final work at the U4′ points was being done. By this procedure, together with the change from air to electric motors on the boring machines, the work was considerably speeded up to the extent that two pins were changed out every two days, instead of reboring and changing the pins only on Sundays as originally planned.

Replacing Pins in Swing Span

While the new pins were being changed out in the upper chord of span No. 4, preparatory work was begun for the swing spans No. 2 and No. 3 (east and west arms). The sequence of procedure for these spans called for repinning the L1 points, followed by repinning the L2, U1 and LO points. Preparatory to this work, blocking and jacks were moved out on the ends of the island fender that projected upstream and downstream from the pivot pier, and temporary gusset plates were applied for holding



3 **BORING OPERATIONS** required several passes of the cutting tool to produce the desired pin-hole diameter.

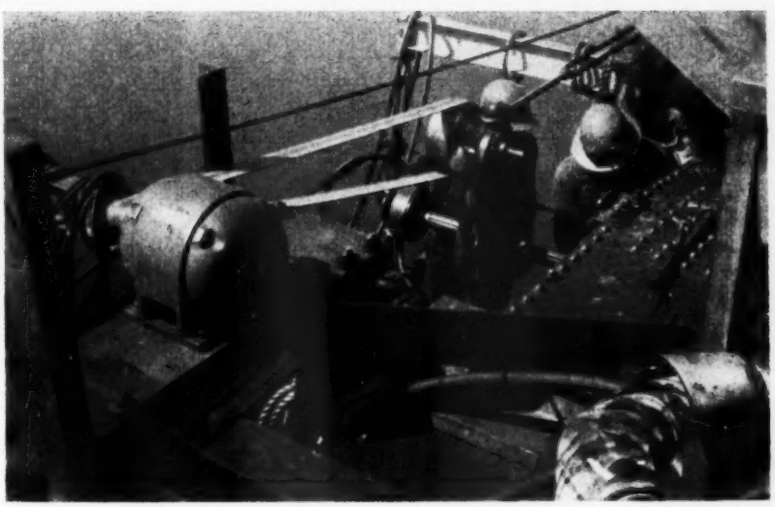
4 **REAMED HOLE** is now ready to take larger-sized pins, thus correcting former looseness in affected members.

the post and diagonals to the lower chord. The swing span was turned so that span No. 2 was over the upstream island fender. The bottom chord was then wedged up to take the load off the pin at the L1 points, the existing 6⅛-in. pins were removed, the members were positioned at these connections, the pin holes were rebored, and new 6¾-in. pins were installed.

Because the old pins were grooved from mechanical wear, it was necessary to burn one of them into nine pieces for removal. Since this took considerable time, temporary 5⅞-in. pins were installed to restore the span to service overnight. The 5⅞-in. pins were left in place until the next day when the holes could be rebored in two passes of the boring machine and the new 6¾-in. pins installed.

When the pin-renewal work in span No. 2 had been finished, the swing span was turned to place span No. 3 over the upstream fender where the same blocking was employed to change out the pins of the L1 points of that span. The blocking was then shifted and, following approximately the same work procedure, the L2 points of spans No. 2 and No. 3 were repinned. The U4 points of these spans were repinned with the same procedure as used when changing out the pins in the upper chords of spans No. 1 and No. 4. It required three passes of the boring machines to install the 6½-in. pins at the U1 points of span No. 3 and four and five passes to install 7-in. pins on span No. 2.

For the LO points of spans No. 2 and No. 3, temporary angles were used to hold the LO-U1 and LO-L1 members together. Jacks were placed under the LO stringers and L1 floor beams for adjusting these members to proper position before the temporary angles were placed. While this loosened the pins, they had to be cut out because of ridges formed by mechanical wear. Three passes of the boring machines were made before the new 6½-in. pins were installed.



ELECTRIC MOTORS were installed replacing the air motors, which speeded up operations.

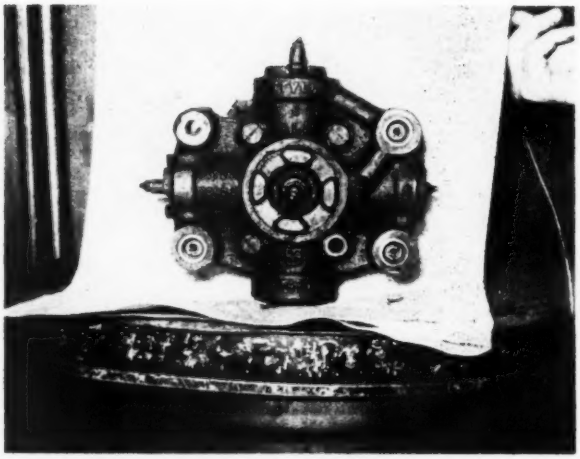
Done in 2½ Months

After the last pins had been installed, the end wedge rollers of the swing span were adjusted, rails were shimmed to meet the ends of the swing span, the turnbuckles of eye-bars on all spans were adjusted, and rivets were redriven on spans No. 1 and No. 4, inclusive. The contract work was completed on November 6, 1953, or in a period of 11 weeks, although it had been originally estimated that 14 weeks would be required. In general, this work accomplished what the railroad set out to do, however, there is still some looseness remaining in some of the eye-bars and consideration is now being given for shortening them, which work will be carried out by railroad forces.

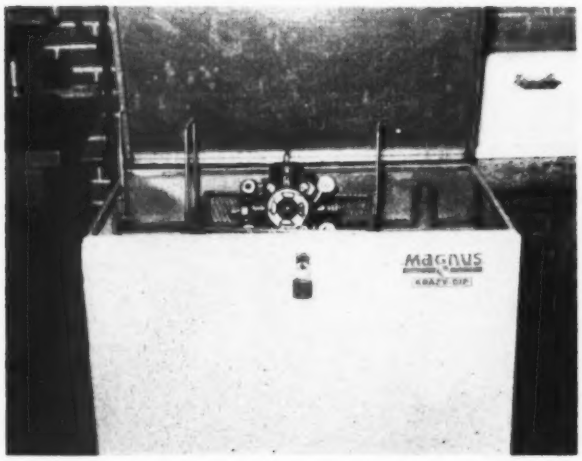
The work was carried out under the general direction of C. H. Mottier, vice-president and chief engineer of the railroad, and under the general supervision of M. Block, engineer of bridges. The field engineering was under the supervision of a representative of Modjeski & Masters.

How It's Done . . .

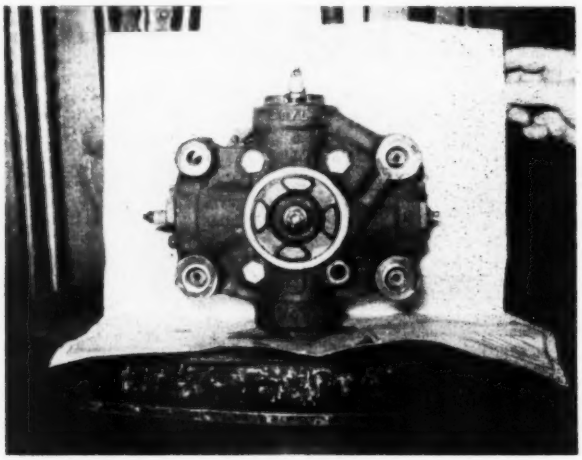
ELECTRO-PNEUMATIC switch control units are removed from their housings in preparation for being cleaned.



AFTER MAGNETS have been removed the valves without further dismantling are . . .



. . . PLACED IN a Magnus cleaning machine where violently agitated solvent . . .



. . . REMOVES all dirt and dried grease inside and out in the matter of minutes.

Mechanical Method for

Cleaning Switch-Control Mechanisms

● A new method for cleaning switch-control mechanisms is reported to have sharply reduced the time and labor required for the maintenance of approximately 500 electro-pneumatic switches operated by the Terminal Railroad Association of St. Louis. This is the total number of switches entailed in the operation by this company of the St. Louis Union Station and in the handling of about 50 per cent of the industrial switching, together with transfer work, over the bridges between St. Louis and East St. Louis.

With this new cleaning method—an entirely mechanical one which replaces manual procedures—the railroad reports that not only is cleaning time drastically reduced but that superior cleaning results are also obtained. The new system, called the Magnus mechanical agitation method engineered by the Magnus Chemical Company, Inc., involves the use of a mechanical washing machine charged with a specialized decarbonizing cleaning solution. The cleaning machine operates on the principle of solution-agitation which is quite similar in principle to that of a modern clothes washing machine.

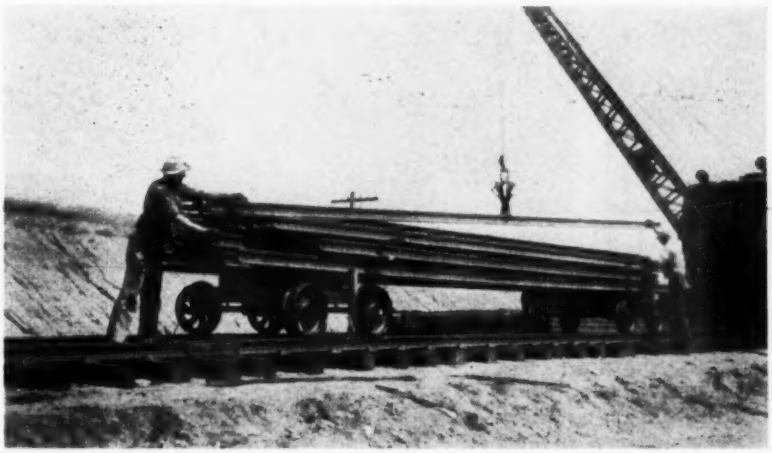
Parts to be cleaned are placed on the machine's grid-like cleaning platform. The platform goes into operation with the flick of a switch, raising and lowering the parts through the cleaning solution 54 times a minute. The vigorously agitated solution rushes in and through all parts, shearing away the dirt deposits which have been loosened by the cleaning agent. When removed, minutes later, the parts need only to be water-rinsed to look like new.

The machine accommodates four operating valves at once. Previously it took considerable time to clean one valve by hand methods. Now four complete valves are cleaned, inside and out, in 30 min. or less.

One man in charge of the Magnus cleaning machine handles the entire job. It is reported that similar savings in time and labor have been obtained in the cleaning of other switch equipment, such as operating pistons and interlocking apparatus including parts of switch-and-lock movements.

The specialized decarbonizing compound used is a solvent-type cleaner especially developed by Magnus for the agitating method. This compound forms a solution that is said to offer highly penetrative action for the removal of paint, oil, dried-hard alemite grease and other subborn dirt deposits, down to the bare metal of the parts. A characteristic claimed for it is that it will not pit, tarnish or otherwise injure even the softest metal. Because solutions of this compound may be used over and over again, and the contaminated solutions may be easily reclaimed, savings on cleaning material are also substantial.

Although the Terminal Railroad Association's switch-maintenance program is a large one involving quarterly inspection and maintenance of all switch controls, a single Magnus cleaning unit, with a work capacity of 250 lb., has proved of sufficient capacity to handle the company's complete needs. It is reported, moreover, that savings in time, labor and cleaning material in the first six months of operation have more than offset the unit's initial installation cost.



WOOLERY RAIL CARS, in pairs, are used to transport rail to a Burro crane which lifts each rail off cars, swings around and lays it—in one motion.

Special Equipment; New Techniques . . .

Speed Laying of New Track

By C. M. Hayes

Supervisor Equipment,
Maintenance of Way
Soo Line, Minneapolis.

● Through the use of two rail cranes, heavy-duty push cars, power spikers and bolting machines, and efficient organizational techniques, an 80-man gang was able recently to construct 13.66 miles of new main track and 2 miles of new side track in 25 days.

This new track was constructed at Van Hook, N.D. Before arrival of the 80-man extra gang, the section forces had distributed five miles of ties and tie plates along the new grade in position for laying the rail. All of the material for the job had previously been placed on skidways adjacent to a 100-ft. spur track to which the new track was to be connected.

The track laying was organized in accordance with our general practice on new-line construction. That is, we used a Burro crane for laying the rail, and pairs of heavy-duty Woolery rail cars for transporting the rail from the stockpile to the laying location. Since these cars each have a capacity of 10 tons, the capacity per load is 20 tons. A second Burro was used at the stockpile to load the rail on the rail cars and transport them to the front crane. Under this system the front crane laid rail directly from the rail cars and, when the cars were empty, they were merely set alongside the track and later rerailed by the second crane for return and reloading at the stockpile.

When the hauling distance became so great that the back crane could not keep the front one supplied with rail as rapidly as needed, a power car was used for hauling rail from the stockpile to the front crane. We had one of these power units and six Woolery rail cars which gave us three complete hauling units. With this arrangement one set was loading, one set was on the road and one set was at the front with the lead crane, thus keeping the operation running continuously.

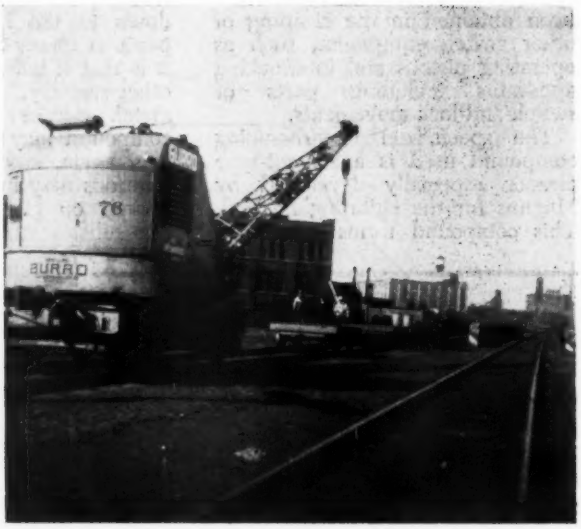
Ahead of the main gang we used a group of 16 men and an assistant foreman equipped with three trucks. This small gang hauled ties, tie plates, rail anchors and angle bars from the stockpile and distributed the material ahead of the main gang on the finished grade. The ties were laid to a tie line and properly spaced so that all the following gang had to do was lay the rail and spike it in position.

In laying this track we also deviated somewhat from the common practice of spiking the line side and then the gage side, since this method bunches the spikers and causes confusion and delay. To overcome this, I introduced a system whereby all four spikers spiked on one rail at a time and, instead of using line and gage spikers, we had head and rear spikers. The rear spikers carried the gage and spiked alternately the right-hand and left-hand rails to gage. With this method I never saw a time when the spikers were not ready for the next rail when it was set in place. Since we spiked only two ties per rail ahead of the crane, one in each quarter, each man had only one spike per rail to drive.

I am quite certain that this new technique in spiking and the system which we worked out for using the Woolery cars without making any switches contributed a great deal in making it possible for us to lay a mile of track in 6½ hr., or 800 ft. per hour.

Planning Yard Maintenance . . .

FAIRMONT DERRICK car loads switch material and . . .



BURRO CRANE handles rails for transfer to the job on . . .

What One Railroad

Advance planning of yard work is fundamental, according to the author. A successful plan must entail cooperation with the operating department and is dependent on experienced and intelligent supervision. It must be elastic enough to accommodate the unexpected which continually rises to plague any long-range program.

By N. F. ALBERTS
General Track Foreman
Milwaukee Road
Chicago

● In planning a work program in a yard, one must first be familiar with the handling of track work in general. In addition one must have complete knowledge of, and the ability to carry out, the various jobs as required. One must be competent and experienced and be able to judge the approximate number of man-days required for each job. One must also know the short cuts that will help speed up work and must be familiar with traffic conditions and train movements.

With this knowledge in hand the general track foreman will be able to set up a work schedule and allot the approximate amount of necessary labor to each of the various jobs, keeping in mind at the same time that some tracks offer the possibility of a full day's production, while others may be unobtainable for extended periods due to traffic interference. One of the most important items to be considered in drawing up a work schedule is the availability of the necessary power-driven work machinery. This is the secret of mass production.

The writer has been in the practice of developing a plan of work for the territory under his supervision for a number of years. This program of work has proven most effective in spite of the number of odd jobs and interruptions that have developed unexpectedly during the working season.

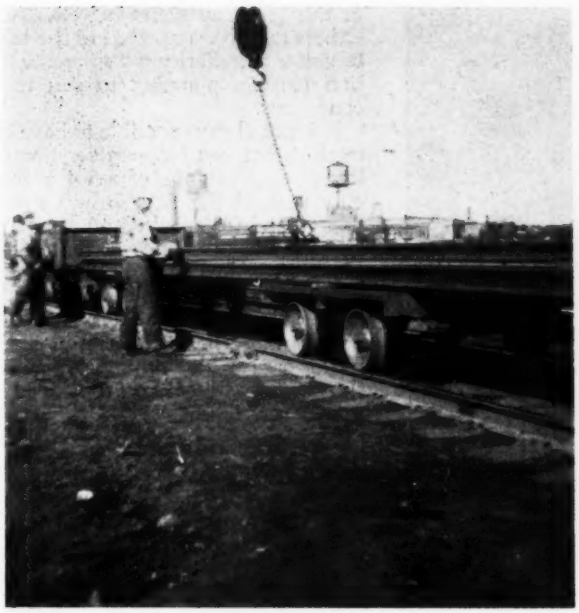
The best plan for programming the work in yards is based on a one- or three-month work program. Planning a work program based on a small section gang or small yard gang offers the disadvantage of a force subject to disruption because of the necessity of performing small jobs during the daily work periods. These small jobs, such as the repairing of run-through switches, picking up derailments, oiling of hand-throw switches, etc., offer interferences that may nullify the advantages of programming the work of a small gang.

Some railroads have revamped their track-gang or yard-gang organizations by the consolidation of several sections into a fair-sized territory, under the charge of a general foreman. These railroads have been more than repaid by this change. Under this system the gang size is immediately enlarged, thereby increasing the possibility that jobs may be tackled and completed without interruption.

Terminal Districts Organized

On our railroad we do not use the ordinary yard gang. We have terminal yard districts or yard gangs. Each district comprises from 50 to 90 miles of track and from 250 to 400 switches. This trackage includes from 12 to 20 miles of fast main-line track, with the remainder consisting of yard tracks. Also included are a number of street crossings, railroad crossings and interlocking plants.

The terminal district is under the supervision of a general foreman with an assistant general foreman. There are approximately ten laborers allotted to each district the year around. One of the laborers in each district receives a higher rate of pay. He operates the motor car and transports the men to and from their work. He also transports the material to be used. He is generally the power drill operator. A lampman is assigned. He cares for from 150 to 200 switch lamps on his territory. Some districts have a janitor



HEAVY-DUTY push cars with long draw-bar while . . .

TOOLS, MATERIAL are loaded on cars with boxes and trays.

Does About It

who cares for five or six interlocking towers, several railroad stations and six or seven yard quarters. A machine supervisor reporting to the terminal roadmaster sees that motor cars and other machinery in the terminal district are kept in good working condition. He also looks after approximately 40 rail lubricators in the terminal, drawing one man from the district on which he is working to assist in filling the lubricators.

Power Equipment Available

The necessary power-driven equipment, such as bolt tighteners, spike pullers, spike drivers, power jacks, adzing machines, power rail drills, tie saws and power tampers, is obtainable as required. In addition, each district is equipped with one or two heavy-duty motor cars and two to four heavy-duty push cars. These push cars are used to transport rail, ties and other material. In addition two to four push cars are equipped with trays for the transportation of tools and small track materials. One heavy-duty push car is also supplied to support a two-ton Converto dump-box body furnished by the Brice Hayes Company. This dump box has been in service for over three years and is used for the transportation of small track material and for handling and disposing of track scrap. It is also used for handling dirt and refuse around the property. A Fairmont hand-operated derrick car is used for handling frogs. A self-propelled gas crane or diesel crane operates jointly on two of the terminal districts.

With this equipment we are able to load and transport from 10 to 20 rails, plus angle bars, tie plates and other necessary fastenings, to the point where the material is to be installed. We can load a complete split switch or complete turnout, make the installation and haul the recovered scrap material back to the material yard, located near the gang headquarters. Under this arrangement the usable and scrap material is assembled and maintained at one main point.

No Work-Train Expense

Elimination of work-train expense is another advantage of using equipment of this type. The only work train expense we have is for a conductor and an engineer pilot who are required in connection with the movement of the self-propelled crane. Last year, one district handled and installed 50 complete split switches or turnouts, approximately 60 track miles of rail and 4800 cross ties and switch ties without the use of any work train service.

We have a terminal track inspector who inspects the mainline tracks. He reports to the terminal roadmaster but furnishes a copy of his inspection report to the general foreman having charge of the mainline territory inspected. Many years ago we discontinued the practice of having track walkers for the yard tracks.

When, in the judgment of the general foreman, occasional repairs to switches, insulated joints, etc., are required, two men are sent to make them. There are about 600 insulated joints on some of the terminal districts and these require frequent attention. Except for special and extraordinary repair work, no extra gangs have been employed on one terminal district for at least 15 years.

We plan a work program and also estimate the number of men required to carry out this program. This program is made up by the general foreman for his territory. It is based on the number of addi-

This article is based on an answer Mr. Alberts submitted to the question "How can track-maintenance work in yards be planned and executed to assure maximum production per man-hour with a minimum of interference with the operation of the yard? Explain." Other answers to this question will be found on page 60 of this issue.

DERRICK CAR is also used for placement of frogs and other heavy switch material.

tional men which he believes he will be able to obtain. This estimate is generally based on an additional 15-men allotment for the crew, which will give the gang a total of approximately 25 laborers.

Program Reviewed and Approved

The terminal roadmaster reviews this program and, in conference with the general foreman, decides which of the items are essential. The program is then revised, and the work itemized chronologically in the order of importance. The terminal roadmaster then submits the revised program for approval. If the program is accepted the allotment of necessary men is generally approved for the gang.

The terminal gang of about 25 men is organized as follows: An assistant general foreman and about six of the regular men attend to the various odd jobs on the district, such as repairing switches, replacing broken rails, etc. The remainder of the gang with the general foreman in charge concentrates on the out-of-face work called for by the program.

The planning of work is usually the responsibility of the general foreman who must be competent to select the tracks and leads to work on. He must schedule the work to be done to correspond with the amount of labor allotted for each job. He must also see to it that the work is carried out in an efficient manner and that it meets the standards of the railroad.

When drawing up a schedule for the work to be done by the augmented force of 15 to 25 men for a period of from two to three months, a copy of the proposed work schedule is furnished to the terminal superintendent. This is done only to have required work approved and does not consist of notification of the dates on which the work is to be done. The schedule dates of work is omitted so that we may coordinate our work with that of the operating department and interfere as little as possible with the operation of the yard.

Terminal Roadmaster Follows Up

With this work program in front of us, we know what we are going to do. The terminal roadmaster, working in close contact with the general foreman, sees that the scheduled work is being carried out. The work program is followed as closely as possible. On occasion we have to rearrange the schedule due to material shortages, force reduction or an emergency job that may come up unexpectedly. We also rearrange our schedule whenever it interferes with the operation of the yard.

When we plan to work on a lead or yard track, advance notice is given to the yardmaster. We advise him of our plans and the time it will take to complete the job. The yardmaster and the general foreman then agree on the time when the operation of the yard will be the least disturbed. The terminal roadmaster in turn handles with the superintendent. In proceeding with the work, the greatest consideration is given to the more important movements in the yard. Some leads or ladder tracks are very congested in the first few hours of the day. Others may be congested in the afternoon. Familiarity with the situation permits planning to suit the conditions.

It is not always possible to have a track taken out of service. Some tracks may be out of service for only part of the day. Others may be on hand for a full day, but must be returned to service at the close of our work day. In still other cases, we may hold the track out of service for three or four days or even longer until the job is completed. In this case work equipment or machinery may be held on the "dead" track over night.

Safety of Importance

One item of importance is the matter of safety. Before material is distributed along a track or lead, the superintendent's office issues a bulletin or lookout order to all concerned. This lookout order advises the location and type of material that has been distributed. All departments receive a copy of this lookout order and are alerted. Upon completion of the job, the released material is picked up and the lookout order is cancelled. Another item which helps speed up switch and turnout renewals is the preparation of all stock rails before the job is started. Guard rails are also fastened to the rails. These items are then stock piled at a convenient point near where they are to be installed.

Some of our main lines are subject to spillage of foreign material from cars in transit and require frequent attention. Cleaning is necessary to avoid failure in signal operations. All cross and switch ties recovered from tracks must be loaded on push cars and trucks and hauled to points where they can be burned or disposed of.

The regular men of the terminal gang are generally home men who have acquired seniority by steady employment. The additional men are secured from our labor office. They are not steady workers, being generally of the floating gang variety. They are housed and fed by a boarding company centrally located in the terminal. They carry their lunch and are transported by train, truck or bus to the work location.

From the above outline it can be seen that careful planning and execution of work will assure the maximum production per man-hour with the least interference with the operation of the yard.

Too Cold for Ballasting?...

LOW-MOISTURE GRAVEL, plus special handling methods, permits ballast unloading in freezing weather, as shown here at 45 deg below zero. Snow is cleared from track with Jordan spreader prior to unloading gravel.

...The QNS&L Says--Never!

● To fulfill its goal of "Ore by '54," the Iron Ore Company of Canada and its subsidiary, the Quebec, North Shore & Labrador, have resorted to many novel practices in constructing a 360-mile line to tap rich iron ore deposits. One of the most interesting is the laying and ballasting of 132-lb track on frozen subgrade at temperatures as low as 56 deg below zero.

Prior to track laying the finished subgrade is cleared of snow, using tractors and road graders. Ties are then placed on the cleared subgrade and rail is laid using a Burro crane and demountable rail carrier cars consisting of modified freight car trucks, which are towed behind the crane and set off when empty.

Because of freezing weather it had not, until recently, been possible to keep the newly laid track ballasted and surfaced immediately behind the rail laying as was desired. However, in order to reduce the quantity of construction materials being flown in by the company-owned and operated airlift, material trains were operated over skeletonized track between the rail-laying

Progress on the QNS&L

The Quebec, North Shore & Labrador is being built from Seven Islands, Que., on the north shore of the St. Lawrence estuary, to Knob Lake in Labrador, a distance of about 360 miles measured along the railroad. Work was begun on the construction of the new line in 1951 and is scheduled for completion this year. An article in the April 1953 issue of *Railway Track and Structures* gave general information on the new line and told how track was being laid with the aid of demountable cars for handling rails.

Up to the winter of 1952-53 track building operations had progressed from Seven Islands northward to mile post 108. Subsequent construction progress since that time may be summarized as follows:

Track laying operations were recommenced at mile post 108 on February 7, 1953, and an important air strip at mile post 134 was reached March 31, 1953, where work was halted temporarily. On June 8, 1953, track laying was again begun and progressed continuously until February 13, 1954, when it reached mile post 358.11 at Schefferville which is in the Knob Lake ore area at the north end of the railway. Ballasting began at mile post 102 on April 6, 1953, and the first surface was given the track as far as mile post 231 which was reached November 1. Operations were suspended on that date due to freezing weather, but were resumed on January 21 this year as the result of a development described in this article.

HEAVY SNOW and frigid temperatures don't discourage track-laying crews which have laid 250 miles of track in the past year. A Burro crane and special rail cars modified from freight-car trucks are used in laying the new 132-lb rail.

location and where ballasting was suspended due to cold weather.

Because this newly laid track was being kicked out of line and ties were slewing under the movement of trains, some means of ballasting in freezing weather was sought to eliminate this trouble and allow supply trains to move to the rail head. Explorations revealed a large pocket of comparatively dry gravel located in a gravel esker at mile post 290 which lay parallel to and about one-half mile west of the main line. The pit contained about a million cubic yards of material suitable for ballasting and which would require very little processing.

Plans were made immediately to take advantage of the availability of this ballast material. Tracks for loading the ballast were built in to the pit and the operation begun. The gravel is excavated below a frozen crust varying from two to three feet in thickness and has a natural moisture content of between 6 and 7 per cent, with a ground temperature of about 40 deg.

In order to prevent this material from compacting and freezing in the cars, it is deliberately allowed to freeze before loading. This is quite easily accomplished since the average temperature has been around 25 deg below zero. Each day a shovel stockpiles the material required for the following day's loading, and overnight this stockpiled material freezes into a dry, free-running state. The next day the gravel is loaded into ballast cars and is moved to the unloading location for distribution the same day.

After the ballast cars have been loaded, the shovel moves back into the pit face to stockpile material for the next day's loading. Should the temperature rise above 15 deg before the ballast is unloaded, the material tends to become sticky and difficult to work. However, the prevailing low temperatures have made distribution possible with little more trouble than is experienced in summer operations.

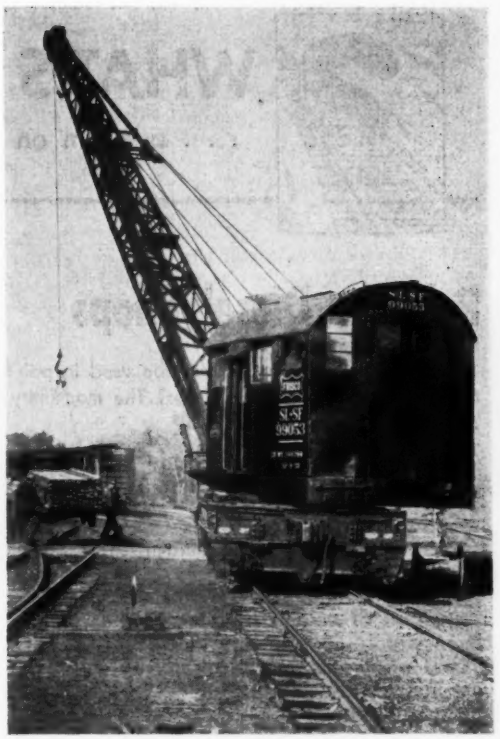
Over 22,000 cu yd of ballast were distributed during the first month of this operation, and only one day's delay was encountered during that time due to the material freezing up in the cars. It is expected that distribution will continue until early spring when the likelihood of intermittent freezing and thawing will prevent proper handling.

An 18-man crew is now in the process of spot surfacing where this ballast has been unloaded. It is planned to increase the size of this gang and use a mechanical tamper in order to make an out-of-face lift on the track which has been ballasted. The ballast program calls for the placement of almost a million yards of gravel before August 15, 1954.

In addition to the gravel being used as ballast, plans call for using some of it in bank widening to strengthen the subgrade shoulders. Portions of the subgrade consist largely of sand and other varied light material taken from side ditches and borrow pits nearby. This material erodes very quickly and the application of gravel will serve as armor to hold the less stable materials in the dump during the spring breakup when considerable trouble has been experienced.

We are indebted for the information contained in this article to Mr. J. W. Buford, coordinator of Canadian development for the M. A. Hanna Company, Cleveland, Ohio, one of the concerns with financial interests in the new road.

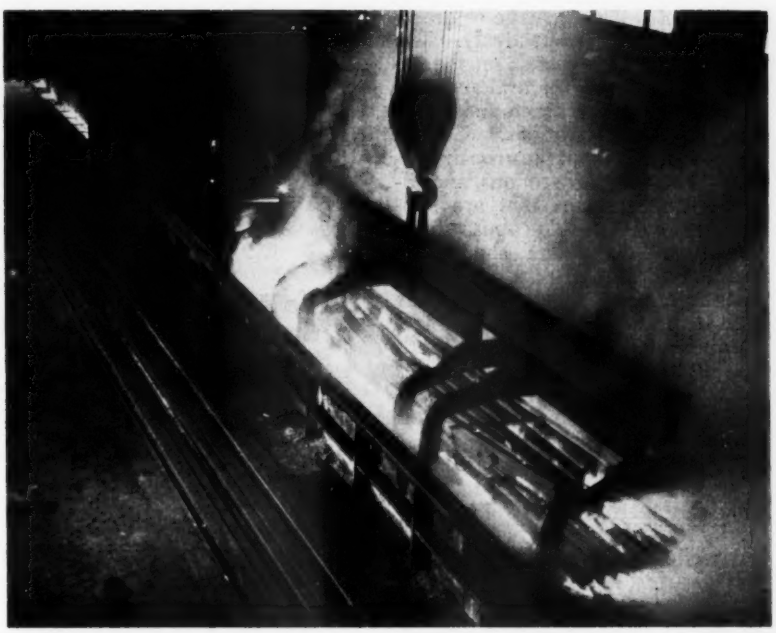
NEW ORE UNLOADING DOCK, built at a cost of $10¼ million, was recently completed by the Pennsylvania at Philadelphia where it is located on the Delaware River. Iron ore is unloaded from vessels by machines in background and then elevated by conveyor belts to headhouse at left where it is discharged into hoppers and then into railroad cars. Conveyor belts are 1550 ft long and lift the ore 80 ft.



NOW DIESELIZED is this 30-ton locomotive crane owned by the Frisco, which was formerly steam driven and is now in use at the road's heavy car repair shops in Springfield, Mo. It has been fitted with a Caterpillar D318 diesel engine and also has had the cab redesigned to provide maximum operator visibility. As a result of the performance of this unit the Frisco is now improving two more locomotive cranes with diesel engines, and plans to convert 22 additional units in the same manner.

News Briefs in Pictures . . .

S. R. HURSH, chief engineer, Pennsylvania, delivering an address recently before the Metropolitan Maintenance of Way Club at New York. He spoke on the need for training courses on the railroads for future officers. The answer, he said, depends on the size of the railroad and its policy on transferring men among departments.



SPECIAL TRACKWORK is heat-treated and tempered at Steelton plant of Bethlehem Steel Company by means of facilities that have recently been expanded to permit items to be handled in lengths up to 60 ft.

WHAT'S THE ANSWER? . . .

. . . a forum on track, bridge, building and water service problems

Painting Diesel Shops

What color or colors should be used in painting the interiors of diesel-locomotive shops? The machinery and other appurtenances? Explain.

Follow Color Safety Code

By W. F. Armstrong

Architectural Engineer
Chicago & North Western, Chicago

During the past few years the principles of color dynamics have been widely accepted by industry. These principles may generally be applied to the painting of diesel-locomotive repair shop interiors.

In new buildings it may not be necessary to paint wall surfaces, depending on materials used; however, in old buildings that have been converted into diesel shops it is well to give the entire interior a thorough cleaning and painting so that dirt will not damage the delicate diesel parts.

Wall surfaces should be a light shade of green, yellow or grey, with a dado of a darker shade of green, tan or grey, respectively. The choice of color depends on the exposure, amount of natural and artificial light, use of space and maintenance considerations. Certain spaces such as running repair sections, heavy repair sections, and filter cleaning rooms that are subject to considerable abuse from grease, oil and dirt should be painted with a dark dado to eliminate frequent repainting. Areas above the dado are not as subject to abuse and may be painted with the lighter shades. Other spaces such as engine-overhaul rooms, electrical shops, small parts repair rooms, offices and welfare facilities are not usually subject to excessive abuse and may be painted lighter shades of these colors. Green is generally the most acceptable color in well-lighted areas, yellow in darker areas, and grey in areas that receive excessive abuse.

Roof trusses and other structural steel may be painted a color similar to the walls, or with aluminum or white, if it is necessary to reflect the maximum amount of light possible.

Generally it has been found that the painting of concrete floors is not necessary and that such paint is costly to maintain.

The Color Safety Code of the American Standards Association is a good guide to follow to determine proper colors for some of the following items: Zone marking—yellow: Railings, edges of elevated platforms, cranes, chain hoists, etc. —bright yellow; restricted overhead or side clearances, and other hazardous locations—yellow and black strips; fire protection equipment—red; electrical switches, control panels, etc.—orange; first-aid supply cabinets—green; spot-tag symbol to identify equipment "down for repair," or "do not move, use or start"—blue.

Pipe lines are often painted with bands of specific colors to represent the materials carried. The following are suggested colors: Fire lines—red; hot water—orange; cold water —white; lubricating oil—green; air —light blue; steam—grey.

According to the principles of color dynamics, the body of machinery should be painted green, critical or operating parts, buff, switches and control panels and guards around dangerous parts of machines, focal orange.

The proper use of painted surfaces can do much to improve the general morale and efficiency of the employees, relieve eye strain, and promote safety.

Color an Efficiency Factor

By Louis Cheskin

Director, Color Research
Institute of America, Chicago

Color is a factor in the efficiency of any workshop. Colors should be used in the diesel locomotive shop that will give the workers good visibility, maximum safety from accidents and psychological incentives,

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the July Issue

1. When ties are renewed in connection with out-of-face surfacing operations, what advantages, if any, would result from spiking the new ties after the track is tamped? Explain.

2. To what extent is it economical to recondition scale parts in railroad shops? Explain.

3. At locations where sand or fine dirt drifts onto railroad track, what methods are best adapted for its removal? Explain.

4. When out-of-face surfacing requires the raising of open-deck bridges to fit the new grade, should the bridge be raised before or after the track raise is completed? Why?

5. Should new rail be protected by a slow order? Explain. If so, how long should the slow order remain in effect? Why?

6. What effective methods may be used to prevent corrosion of the pipe lines serving automatic car-washing facilities? Explain.

which will result in increased production. The following are some of the basic factors to know in using colors for getting maximum efficiency:

1. White walls create glare and contribute to inefficiency.
2. Large black or gray surfaces are depressing and contribute to absenteeism.
3. Cheerful surroundings make cheerful workers. Drab colors make sluggish workers.
4. Warm places of work can be made to feel cooler by surroundings of cool colors—neutralized or grayed blue-greens or green-blues.
5. Cool places of work can be made to feel warmer by surroundings of warm colors—peach or beige.
6. Deep colors on walls and furniture absorb much light, require more foot-candles of light and result in large electric bills.
7. Light colors reflect most of the light and aid in illuminating the interior, thus providing proper light at less cost.
8. Work backgrounds (walls, tables) that are too light or too dark cause eye fatigue and hinder production.
10. Mat or dull surfaces and surfaces that have proper contrast to the material worked on aid production.
11. Primary hues of specific identity can be used for identifying machines, pipes, controls, etc.
12. Warm, bright colors — yellow, orange or red—applied to dangerous parts of machines keep the worker alert and prevent many accidents.

The colors in the shop should be appropriate not only in hue. The right value or light and dark contrast factor is equally important.

We can appreciate the full role of color as a factor in efficiency only by realizing that color affects people both optically and psychologically on an unconscious level. In other words, people do not realize that color has an effect on them. We rarely are aware that color influences our behavior or emotional stability.

Base on Suitability

By H. M. Harlow

Assistant General Supervisor B&B
Chesapeake & Ohio, Richmond, Va.

The question of selection of colors for diesel-shop interiors should be based on what is most suitable for proper lighting or light reflectance, pleasing appearance, cleanliness, protection against corrosion and economy of maintenance.

For lighting, the shade and sheen of the color is more important than the color itself. On the upper sidewalls, ceiling and roof members light shades of gray, green, yellow or blue are very satisfactory. If lighting is adequate, the sheen should be a semi-gloss, rather than a gloss. The glossiness can be increased if the lighting is not too good and in this way reflectance can be improved. Glossy or semi-glossy finish will wash better and more often than flat finish.

The colors should harmonize, if more than one is used. Deeper and darker shades for trim and dado are desirable and variations of the same colors used for sidewalls and ceiling are always good. From the practical standpoint of cleanliness and economy of maintenance, the dark dado or wainscot is much more satisfactory, as the lower portion of the wall is always subject to soil or damage and the appearance will be better over a longer period of time. Dadoes may be any height from around four to eight feet, depending upon local conditions and lighting requirements.

Metal windows, doors or roof structures should have a metal protective priming coat prior to application of the finish coat. This is good practice for protection against corrosion. While corrosive conditions are not bad in the average diesel shop, a rust-inhibitive coat next to the metal will serve a good purpose in case of future change in conditions.

Joint Tie Economy

To what extent is it more economical, if at all, to maintain joints on hardwood ties as compared with those on softwood ties? What factors of cost are involved in this question? Explain.

Hardwood Most Economical*

By G. M. O'Rourke

Assistant Engineer Maintenance of Way
Illinois Central, Chicago

The question of the cost of maintaining a rail joint on hardwood and softwood ties was raised in connection with an inspection by the Track committee of the AREA of our test track between Monee and Kankakee, Ill. A quick review of our cost data disclosed no answer to this question. As a result, I followed a policy which, over the years, has produced constructive answers to such moot problems; I questioned a number of practical men.

Five questions were put to these men—roadmasters, supervisors of track and section foremen—requesting their comments and considered opinions. These questions were:

1. Comparative life of ties, cost of renewal, etc.?
2. Cost of labor retightening bolts in joints due to difference in flexure of the two kinds of wood?
3. Comparative wear of joint bars?
4. Comparative rail-end batter?
5. Any churning resulting from difference in stiffness?

The replies received left little doubt as to the economies and advantages to be derived from the us of hardwood ties under rail joint. Estimates of relative tie life ranged from one-third to one-half more for the hardwood tie under the joints, with corresponding savings in labor. We felt, however, that these estimates were high and approached it from another angle. C. D. Turley, our engineer of tests, ties and treatment, made a study of the question based on the following premises:

1. Average life of oak crossties, 20 to 25 years.
2. Average life of pine crossties, 15 to 20 years.
3. One mile of track (39-ft. rails) contains 270 joints.
4. Use of two ties per joint (suspended joint).
5. Labor to renew, one man-hour per tie.
6. Labor to maintain one mile of track (Northern Lines, IC, 1952, oak-tie territory) 1154 man-hours.
7. Labor to maintain one mile of track (Southern Lines, IC, 1952, pine-tie territory) 1218 man-hours.
8. Labor to maintain rail joints, 45 per cent of total track maintenance (AREA Proceedings, Vol. 37, 1936, page 477).

*This reply is a condensation of a special report presented as part of the current report of the Track committee of the AREA. The report appears in AREA Bulletin 514, February 1954, page 769.

These data were used to compute the comparative costs in man-hours of maintaining joints on oak and pine ties. The computations appear at the right.

On the basis of these calculations it costs approximately 6.1 per cent more to maintain rail joints on pine ties than on oak ties. Our men in the field believe this is too low. Perhaps, for all practical purposes, a conservative figure to use falls between 10 and 25 per cent.

Cost of Joint Maintenance . . .

On Oak Ties—

Labor to install joint ties (1 mile)	$270\times2\times1=540$	man-hr
Labor to maintain joint ties (per year)	$0.45\times1154=519.3$	man-hr
Total labor per mile	$\frac{540}{22.5}+519.3=543.3$	man-hr

On Pine Ties—

Labor to install joint ties (1 mile)	$270\times2\times1=540$	man-hr
Labor to maintain joint ties (per year)	$0.45\times1218=548.1$	man-hr
Total labor per mile	$\frac{540}{17.5}+548.1=578.9$	man-hr
Difference	$578.9-543.3=35.6$	man-hr

Track Maintenance Work in Yards

How can track-maintenance work in yards be planned and executed to assure maximum production per man-hour with a minimum of interference with the operation of the yard? Explain.

Prepare Detailed Plans

By L. H. Rose

Track Supervisor, Delaware & Hudson
Plattsburg, N. Y.

In order to assure maximum production per man-hour in track-maintenance work in yards and at the same time hold interference with yard operations to a minimum, it is necessary to consider the following three points.

1. Prepare detailed plans of all work to be undertaken, including for each job such items as a list of equipment that can be used to the best advantage, materials needed, number of men required to complete the job quickly and efficiently and the number of work trains needed.

2. Prepare a work timetable giving consideration to the availability of the needed materials, the time when special equipment will be available and the jobs that can be dovetailed to assure a steady flow of production. Such a timetable should provide for alternate jobs in case the tracks required cannot be made available at the last minute because of some emergency condition.

3. Review the program with the yardmaster in advance of the start of work so that he will know which tracks will be out of service and can make his plans in accordance with the volume of traffic he will have to handle.

When surfacing, changing ties or laying rail out of face on yard tracks, it is necessary to take the adjacent track out of service also, in order to do the work as safely and as quickly as possible. When this type of work is to be carried out on ladder tracks, it is seldom that the track can be taken out of service for any length of time. Some time will therefore be lost unless other work nearby can be progressed during the intervals when the ladder track is being used for yard operations.

Run-Off Formulae

Should the accepted formulae for determining run-off from the drainage area be the sole criterion in determining the proper size of a bridge or culver opening? What other factors, if any, should be considered? Explain.

Use Accepted Formulae

By Assistant Engineer

It is necessary to use an accepted formula for determining the size of a drainage opening. This opening should, however, always be subject to review with relation to other factors. It is advisable to use a culvert of maximum size for drainage openings in order to prevent clogging and to expedite cleanout. A 24-in diameter pipe is recommended as a minimum where headroom does not permit larger openings. It is usually false economy to be skimpy with culvert size or length.

Where openings are subject to filling with sand, soil, mud, trash or drift they should be enlarged if practical to allow for this. A minimum 36 to 48-in diameter pipe is recommended. Where practical the culverts should be placed on a self cleaning grade. In some cases pipes have been enlarged for the purpose of making cleanout easier but are at locations where this requires a flat grade. Cases of this nature exist where a 36 to 48-in diameter pipe would have provided sufficient opening and could have been placed on a proper gradient. Such installations would have reduced maintenance because the larger pipes filled completely after most rains, whereas a smaller pipe laid at the proper gradient would have been cleaned through self scouring.

Headroom may prevent installation of a single pipe culvert which would have been otherwise satisfactory. This may occur where pipe would have insufficient cover, or may be necessary to prevent water from rising too high on a fill during peak runoffs. In some locations pipes with a minimum of cover may create a place where frost may heave the track. In such cases a multiple-pipe set-up would be preferred with proper protection for the prevention of scour between pipes. In placing such openings the total required area should not be slighted.

Where a small culvert might be required for drainage through a high fill it is often more economical to use a larger pipe and jack it through. It is likely that in such case traffic delay would also be minimized during installation.

Bridge openings may need to be a panel or so longer than required

for drainage to prevent high dumps from sliding, with the resulting difficulties in maintenance. Where a two-panel bridge might be sufficient it is often well to consider a three-panel opening in order to confine most of the drainage flow, where it is fairly fast, to a clear middle channel away from the bridge ends. Where considerable trash and drift are encountered an extra panel or two may mean the difference between a washout and sufficient time to clean out an opening before damage results.

In some locations it is not always practical to provide either a bridge or culvert as large as runoff might indicate. Such locations occur in bottom lands where the current is slow and where openings serve as much as equalizers as anything else. A properly graded inlet and outlet channel provides the prime means of keeping openings to a minimum size.

Study Area's Past and Future

By H. M. Tremaine

District Engineer (Retired)
Northern Pacific, Spokane, Wash.

The question is posed for all formulae. As pointed out in the American Civil Engineers Pocket Book "a purely theoretical solution is impracticable." In any adequate determination one must, of course, have the background afforded by an understanding of all available formulae. Some of these are not expressed in as much detail as others. This should not, however, detract from the value of their approach.

Drainage areas should be regarded as essentially individualistic. Treatment applied to one is not always applicable in the same detail to others. A full understanding of each project, gained by a field inspection and appraisal based on an adequate study of the history of the area to be served, is a prime requisite. The problems to be evaluated are many and should not be decided solely in the office, based on a desk review. With complete knowledge proper recommendations may be made.

In some instances, because of the cost (and possibly other features) involved, one may be forced to take the calculated risk of either a damage or law suit. This risk must, however, be weighed against the value of the facility affected and the service it performs.

For the field inspection it may be pertinent to point out at least the more important general items which must be given weight, as follows:

1. Drainage area involved.
2. Climate.
3. Slope or slopes of the drainage area.
4. Is area one requiring provision for continuous flow or are there intercepting basins (pot holes) which must be filled to overflow?
5. Character of vegetation — tree growth in volume (wooded area), bunch grass, sod, etc.
6. Character of soil, its porosity when not frozen.
7. Is soil erosion a factor?
8. Does run-off arise solely from rain, or must snow be considered also?
9. Talks with residents has value at times.
10. Proposed arrangement of inflow and outflow channels.
11. Determine effect on flood control, irrigation, stock watering, etc.

These remarks apply largely to culvert and the smaller bridge installations. Larger bridges where a flood plain is involved are subject to special study. In these the formulae have their place. Such bridges are usually designed after full review of the history of the location and a forecast of future requirements such as the effect of dams, irrigation, navigation, flood control works and operations, highways, farm buildings, etc.

Prefers Accepted Formulae

By Field Engineer

This problem is applicable to either of two general situations, new line construction or the replacement of an existing structure.

In the case of new construction, the engineer must estimate run-off from the watersheds crossed. Probably the most suitable method is use of an accepted formula such as the Burkli-Ziegler formula. This, of course, requires fairly accurate rain fall data covering an extended period of time, the longer the better. These data should be available for all of continental United States. The results of the formula should be checked against the appearance of the channel, size of other culverts which may be in the vicinity, and the judgment and experience of the engineer.

For replacement of an existing culvert, there may be adequate flood records which will at once indicate the particular opening to be adequate, excessive, or insufficient. In the absence of such records, the engineer should proceed as for new construction.

In using a mathematical formula to determine the run-off, choosing the proper design storm is crucial. Since weather runs in cycles, wet or cold periods alternating with dry or warm, a record of the rainfall during the recollection of any one man may be quite inadequate. Appearance of the channel and high-water marks may be deceiving for similar reasons. Investigators report a tendency for culvert capacity to be under designed toward the end of a long dry period and vice versa.

Worthy of considerable attention is the run-off factor. It is that portion of the design storm that does not soak in, but immediately contributes to the run-off. The probability of other storms having left the ground in a saturated condition for the design storm should also be considered. The combination of a good snow followed by warm rain has often produced rather startling results over a brief period of time. Expected future changes in character of a drainage area, such as logging off a heavily forested slope, should also be considered.

These comments are not at all inclusive, but merely indicative of the type of question the engineer should ask himself when investigating watercourses. In general, since the "accepted formulae" are really the cumulative knowledge of a number of investigators and since they provide a convenient form in which to apply one's own judgment, their use is certainly preferred.

Watershed Shape Important

By Shirley White

General B&B Supervisor
Southern Pacific, San Francisco

In my opinion, several elements should be considered. Some formulae include a factor that reflects the nature of the terrain, but whether they do or not, this is always important. Also, a long and narrow watershed or one of comparatively equal dimensions affects the amount of the run-off which will reach the opening. A rocky, barren watershed will deliver a larger portion of its rainfall as immediate run-off than will a wooded watershed, or one that is predominantely pasture or meadow land. Cultivated land, and especially an area that has recently been denuded of its cover, as by a

disastrous fire, must be given close consideration, because of the probability of drift or mud flows blocking the opening. In short, the duty of choosing proper sizes of drainage openings can never be safely or economically reduced to the routine application of run-off formulae. Inadequate openings are poor insurance for the investments they protect.

Experience and Judgment

By Superintendent of Bridges

The usual drainage formulae require for solution a coefficient which is determined by the character of the area such as flat, rolling, hilly, or mountainous. This value is determined by the engineer making the investigation and is based on his experience and judgment. For this reason I feel that the answer to the first part of the question is "no" and to the second "a number of factors." A few of these are noted below, using the results obtained from application of formulae as a guide only:

1. Stream history. Often older employees—section foremen, bridge foremen, supervisors, etc.—will give valuable information. In the case of larger streams, this information can often be found in engineering offices of the various governmental agencies.
2. Drift marks. These give a short-range indication.
3. Office records. These will prove particularly valuable in the investigation of larger openings.
4. Size of nearby openings on same waterway. On federal or state highway systems, these openings are installed, usually after very careful investigation, and offer a guide and check to economical solution of the problem.
5. Condition of channel. Will water get away as quickly as it is delivered through the opening? Will it tend to pond? This brings up the question of kind of opening. Will a box or pipe serve better than a pipe arch? A trestle may require more length under certain conditions.
6. Method of installation. In case of Culverts it may be cheaper to jack a 36-in diameter pipe than to open trench and tunnel a smaller diameter pipe. The location may be such that a slow order is very undesirable.
7. In swampy territory and on lines paralleling large streams, trestles and culverts must often handle water—sometimes relatively swift—in the opposite direction of flow.
8. Domestic or industrial stream contamination. It may be necessary to install a larger line and encase it with acid resistant tiles, etc.
9. Possible change in character of area during life of structure. This is a condition which is often found near cities where either or both the residential and industrial areas are expanding. This factor must be carefully considered.
10. Drift. This is usually encountered in combination with other factors, such as swift stream rise, insufficient pile penetration, etc., which could cause failure. This has been a major consideration in replacement of two timber trestles with steel spans on concrete piers.
11. Minimum size. This should be considered where culverts are located where there is possibility of their being blocked. A 24-in line will permit a man to work his way into the opening.

In general, it may be said that the replacement of any structure warrants a complete investigation due to high cost of labor and materials. Each will present a separate problem, the economical solution of which must be made on individual merit. There are, no doubt, other factors which will enter into special installations.

Should Track Spikes Be Snug?

The A.R.E.A. specification for laying rail provides that "1/8 in to 3/16 in space between the underside of the head of the spike and the top of the base of the rail" be allowed. What are the advantages of this practice as compared with driving the spikes snug against the top of the rail base? The disadvantages? Explain.

Traffic Loosens Tight Spikes

By H. A. Halverson

Roadmaster, Chicago & North Western
Boone, Iowa

The reason the spikes are not driven flush to the rail on a new job is due to the fact that the tie plates are not seated in the ties. This permits a slight vertical movement of the rail and this vertical movement will loosen spikes which are driven flush to the rail causing them to raise out of the ties.

We held traffic over new rail at restricted speeds for several days. After this the tie plates are seated. The spikes have not been raised from the ties and can be tapped down flush to the top of the base of the rail and are firmly set in the ties.

Personally, I like the ¼-in space between the underside of the head of the spike and the top of the base of the rail used in laying rail. Later, after the plates are set, all spikes can then be tapped down and you have a good firm job of rail laying.

Over-Driving Damages

By T. L. Kanan

Assistant Engineer of Track
Colorado & Southern, Denver

When rail is being laid out of face, the spikes are usually driven down by air hammers or a gasoline-driven spike hammer, with a very small number of spikes except gage spikes being driven out of face by handspiking with spike mauls.

The spikes are usually driven snug to the base of rail when rail is laid. After traffic moves over the newly laid rail, and the rail becomes seated, there is a gap between the underside of the head of spike and top of the base of rail. Spikes are not usually redriven because in the driving down of spikes they are over-driven. When spikes are driven down against the base of rail, there is always the possibility of damaging the base of the rail. Any damage to the base of rail makes it imperative that the rail be removed from track.

Over-driving of a spike usually damages the head of the spike when the underside of the head touches the base of rail. This turns the spike head back away from the top of the base of rail, and in this way the spike head is damaged, resulting in loss of holding power.

In the use of wooden ties, it is impossible to hold the spike head down tight against the top of the base of rail because of the wave action of the rail as loads move over it. Freezing and thawing weather also have a tendency to push spikes loose from the top of base of rail.

Driving of spikes against top of

the base of rail will frequently result in enlarged spike holes, causing the spike to become loose.

"Slack Spiking" Condemned

By Herbert J. Crannan, Jr.
Track Foreman
New York City Transit Authority
Brooklyn, N. Y.

The claimed advantage of "slack spiking" is that spikes will remain fixed or retain their position in the tie longer. As the rail deflects and raises with the constant receiving and leaving of train loads the vertical movement of the rails has a tendency to extract the spikes. The space provided between the underside of the spike head and the top of the rail base allows for vertical rail movement without putting a strain on the holding power of the spike. By eliminating spike movement, the number of spike-killed ties can be reduced. Also damage to the rail base and springing of the spike head can be avoided by not driving the spike to the point of physical contact. These specific advantages (I admit more can be advanced or claimed) should cause a general saving in maintenance and material.

However, I believe the disadvantages far outweigh the claimed advantages. The foremost argument, in my opinion, against "slack spiking" is that it destroys track unity. This argument is also the most intangible and difficult to defend, lying more perhaps in the field of philosophy than science. But just as we strive daily for the ideal track structure and its perfect maintenance (never quite achieved) we must take track unity into consideration.

The "necking" or wear of the spike shank, under the head where it contacts the side of the rail base, has been attributed to the vertical action of the rail, which causes the base flange to work up and down against the spike. This is usually a condition on poorly maintained track; but "slack spiking" will encourage this from the moment of initial construction. Maintainers—specifically the track walker—in carrying out their assigned duties, of which one is to drive or redrive loose spikes, will certainly be put to test trying to maintain this specified spacing. Can we as practical trackmen believe they will?

Loose spikes to my knowledge have always meant more noise. This may not be appreciated by the observer in open cuts or fills. It is very noticeable to one inspecting track under traffic in tunnels or subways. No investigation, that I know of, has definitely established or disestablished the longitudinal holding power of snug spikes as regards rail creepage. But reason, as well as proof, e.g., spike loosening facilitates rail bumping, tells us that snug spikes must of necessity help prevent this movement. By removing this contact between spike and rail it seems certain that we must either throw an unwarranted load on the present rail anchors in service or increase their number. Such specifications, if they are to be strictly adhered to, must necessarily complicate the job of the track inspector in all new construction.

From the view point of track maintenance, general economy, pleasurable riding, uniformity, procedure, and, perhaps implicitly but certainly ultimately, safety itself I consider this a poor maintenance practice. I am more than mildly surprised that the reliable AREA recommends it. The problem does exist and it is a ponderable one. This practice is a negative solution to it. "Slack spiking," in postponing the raising of spikes, creates new and perhaps even more difficult problems.

Snug Driving of Little Value

By George S. Crites
Division Engineer (Retired)
Baltimore & Ohio, Baltimore

It was found that where extensive track laying was underway that if the rails ahead of the track-laying machine were set to accurate gage there was no trouble encountered in running all the track-laying equipment over unspiked track. It was also observed that, where the rails were set to tight gage, the rails would turn over rather than slip out when equipment was run over them. This showed that any added pressure of the rails on the ties, which might be obtained by driving the heads of the spikes snug against the base of the rails, was of little or no value.

It was also found that pumping joints on straight track in sloppy, or dry sand ballast could be kept from pumping by removing all joint spikes and these joints would still hold their line and gage. These discoveries were responsible for stopping the long-established practice of tapping down spikes which were a little up from the base of the rail.

With the advent of double-shoulder tie plates, with or without pads, all that is required of spikes is to keep the plates in their required position. The fewer holes that are punched into the ties and the less disturbance there is to the fibers of the ties, the better off they will be.

Leakage of Diesel Fuel

What are the most efficient methods for preventing leakage of diesel fuel at flanged or threaded pipe connections or joints? Explain.

Weld All Joints

By George S. Crites
Division Engineer (Retired)
Baltimore & Ohio, Baltimore

Flanged or threaded pipe connections or joints are not recommended or conduits carrying oils of any kind and such joints or connections should never be used in concealed places and should be avoided in so far as possible, even where they are exposed.

The best practice is to test weld all joints and connections which are not to be exposed in order to make sure that no hidden leaks will develop. Such leaks are dangerous and expensive and hard to locate. They may go on for some time before they are discovered and beside the loss of fuel there is liability of a hazardous oil saturation of the adjoining areas.

It may not be economically advisable to use welded joints or connections on all exposed conduits, so these should be of tested materials and assembled with the utmost care. A measured trial run of light oil should be made through any oil conduit before the conveying system is put into permanent service. By such reasonable precautions, future troubles may be avoided.

What Our Readers Think

Expresses Views on Foreman Problem

Watsonville, Calif.

To the Editor:

I have noted with a great deal of interest your editorial, "Solving the Foreman Problem," which appeared on page 39 of the February issue. I assume that one who has spent a lifetime in the track department as trackman and foreman would be entitled to express an opinion on this subject.

The situation in which the carriers now find themselves with respect to the foreman problem is one that is widespread, not being confined to any one general locality. If this problem is properly analyzed from the viewpoint of a foreman with from 15 to 20 years experience, or who is on the verge of retirement, you will find the cause of the difficulty to be among the following reasons:

(1) The difference in the rates of pay now existing betwen trackman (laborers) and assistant track foreman and foreman is not enough to make it worth while to take on the additional responsibilities of foreman. A few years ago the wages of a foreman were about double those of a laborer; now the difference is only about $35 per month.

(2) Some years ago many carriers started the practice of bypassing track foremen when filling positions of assistant roadmaster and roadmaster, relying entirely upon the engineering department. Many track foremen were bypassed because they did not possess a college degree in engineering; in most cases high school was the limit of their education. The carriers elected to break down the morale of the foremen who were qualified for these jobs by selecting for promotion assistant enginers, draftsmen, and in some cases rodmen. These replacements at no time possessed an adequate knowledge of the book of rules, track-car operation, safety, and train operation. Above all they were in many cases ignorant of methods of rail and switch laying, track surfacing, tie renewals and the many other operations regarding which a good track foreman must have an intimate knowledge. Yet these men were placed in charge over the experienced track men who had served the carrier through many years of hardship and who had shouldered the responsibilities through good weather and bad. No matter how great the ability of the trackman, unless he was a college graduate in engineering he was doomed to be an instructor to the college graduate placed in charge of him by the carrier.

Past issues of your publication have stressed this subject, and many fine articles have been written about it by men who are standing at the very peak of their profession. However, as valuable as such articles have been, no concrete steps have been taken to provide a remedy for the problem so clearly defined by your editorial.

It has been said that labor organizations have prevented the carriers from making wage adjustments in favor of the foremen. This causes one, who has been a member of such an organization, to stop and wonder regarding the source of such statements. It has been said that a good extra gang foreman is worth $500 per month; yet the carriers for some reason hesitate to put this into practice. This is a matter that could be adjusted by proper roundtable discussion.

Should the carrier elect to recognize ability in the track foremen they now have by providing proper promotion for those who are qualified and choose to accept promotion, say every third promotion to be a track foreman?

The carriers are mostly to blame for the lack of interest shown by foremen and it can be assumed that, when the present roster of qualified foremen has expired because of deaths, resignations and retirement, there will be a more pronounced lack of men to whom the carriers can look to shoulder the many and varied responsibilities of the track foreman, unless, of course, the roads are willing to make some adjustments which they have in the past seemed reluctant to accept.

I trust that you will accept this letter in the light in which it has been written, and not assume that it merely expresses the idle thoughts of one who does not shoulder the responsibilities that go with the position of a track foreman.

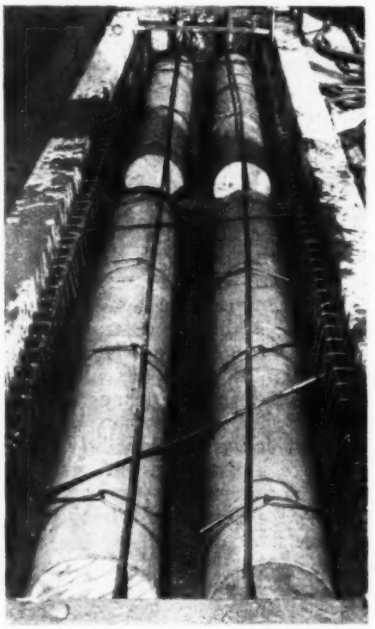
Harold N. Long

PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices

PREFABRICATED TUBES IN CONCRETE DESIGN

THE SONOCO Products Company, Hartsville, S. C., is now marketing a companion product to their Sonotube column form for use in reinforced concrete construction. The new device is called Sonovoid and is designed to serve as a form around which concrete is poured rather than one into which concrete is poured, as is the case with the



Sonotube. Whereas the Sonotube is impervious to moisture from the inside, the Sonovoid is impervious from the outside.

The Sonovoid, which is made of laminated board with a duplex kraft outer wrap, is designed to take up space so as to reduce the amount of concrete necessary below the neutral axis in reinforced concrete roof, floor, wall and deck slab construction. The manufacturer claims that Sonovoids are an economical and comparatively simple method of reducing this dead weight.

(*Please turn to page* 66)

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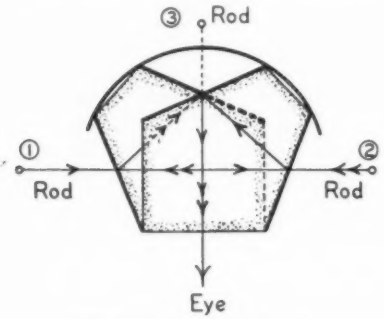
SURVEYING AID

A DOUBLE pentagonal prism, recently introduced, is said to be a valuable instrument in the hands of a surveying party when making property surveys where the preponderance of work requires 90 or 180 deg. angles and the terrain is flat or gently sloping.

This instrument is about the size of a plumb bob but considerably lighter. It is a combination of two prisms and has four windows, two in front (one upper and one lower), one on the right side and one on the left. A plumb bob may be attached to a hook set in the bottom of the instrument if it is desired to define an exact point.

To operate the device, range poles are set at either end of the base line, the prism is held in the right hand of the operator who looks through the lower window,



GEO-OPTIC pentagonal prism

in the front of the prism, and moves transversely to the base line until the images of the range poles, at either end of the base line, exactly line up one above the other. The instrument is then at a point on the base line.

If it is desired to establish a tie-in point, at right angles to the base line, this can be accomplished either by bringing a range pole into line, as seen through the upper window, to coincide with the line poles, as viewed through the lower window, or by moving along the base line until the point to be tied in, as viewed through the upper window, lines up with the range poles on the base line, as viewed in the lower window.

It is claimed that the error in establishing a 90-deg. angle is ± 1.1 min., which is usually satisfactory in all but precision work.

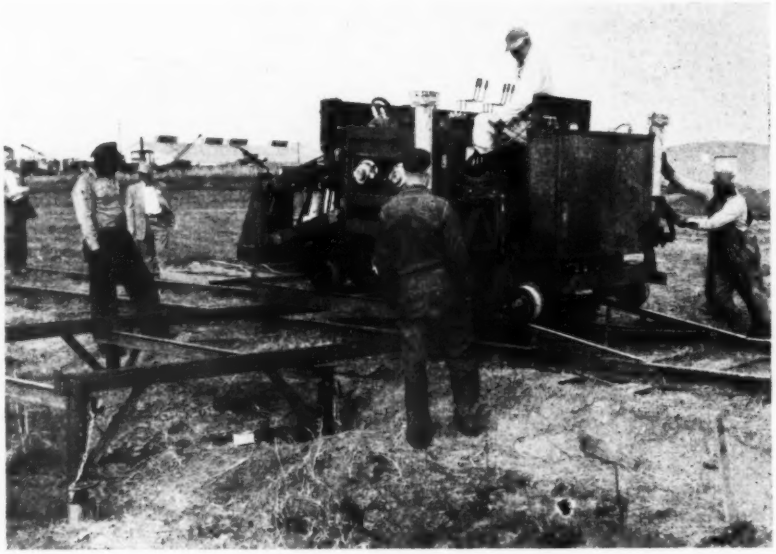
The device is a product of the Geo-Optic Company, Inc., 170 Broadway, New York 38, N.Y.

BONDING DRILL

ALLOY ALUMINUM is said to bring the weight of the new Raco-Everett Universal bonding drill Model 50 to less than 200 lb. The relatively light weight of this drill, which is a product of the Railroad Accessories Corporation, New York, is said to cause it to track excellently and permits easy removal from the rails.

Model 50 has been designed to drill any type of rail in any worn condition, it is reported. This is accomplished by easy adjustment of the drill bit to any position from 16 deg. above to 16 deg. below the horizontal. Adjustable elevating stops have been provided to permit movement of the bit from head to web of the rail, or the reverse, to an accurate predetermined position.

The drill is equipped with a standard ⅝-in. collet chuck. A 9/32-in. collet chuck and oiler can be supplied if required.

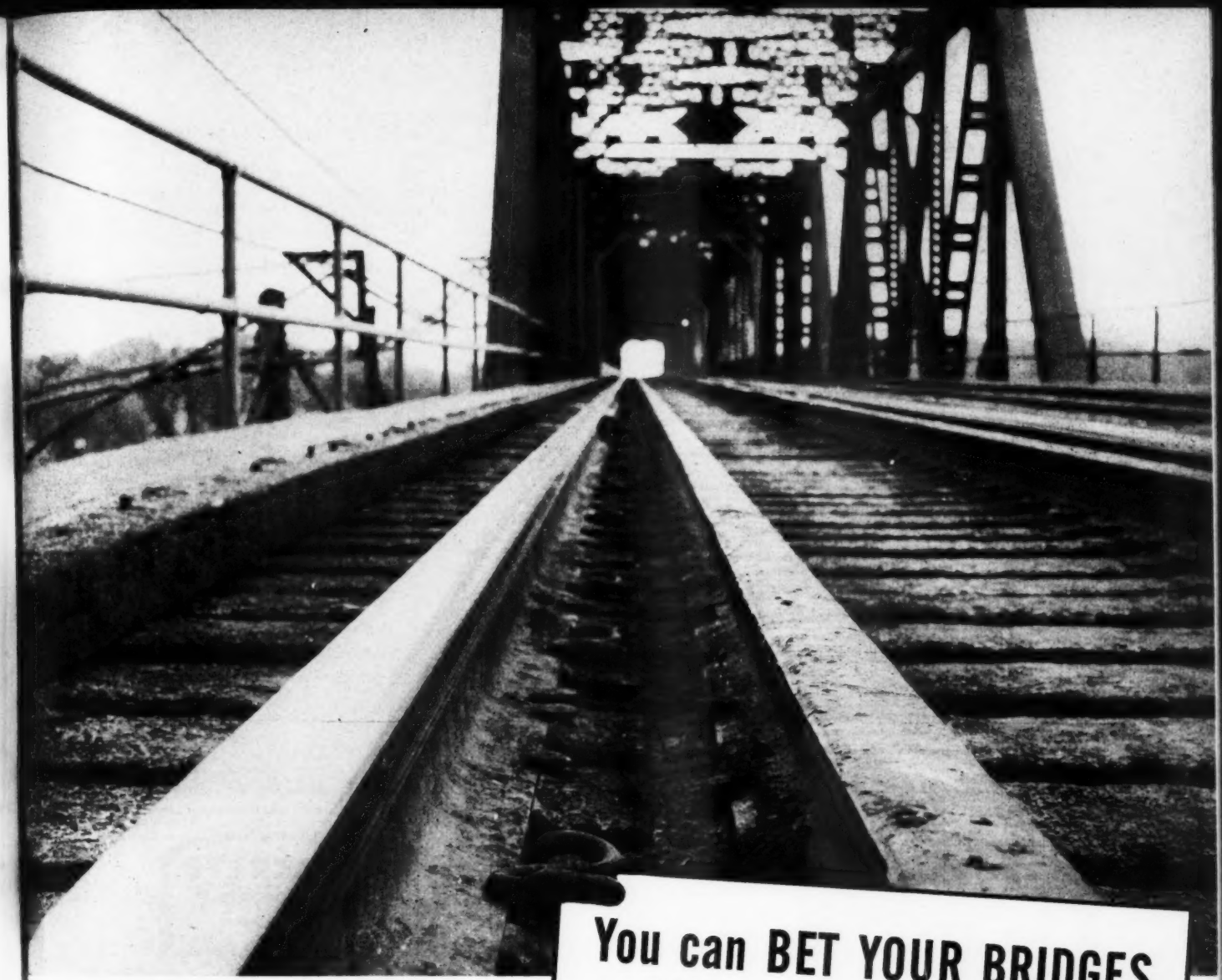


UNIVERSAL SET-OFF

A SPECIAL UNIT designed for removing any on-track maintenance-of-way work equipment weighing up to 14,000 lb. and with an 8-ft. wheel base, has been announced by the Kershaw Manufacturing Company, Montgomery, Ala.

The set-off consists of a complete welded steel frame assembly and is made up of three separate parts which, it is stated, are easily assembled and disassembled when moving from one location to an-

(*Please turn to page* 68)



MACBETH SPIKE ACHORS at work for one of America's leading railroads on an important dense traffic bridge (above).

MACBETHS are easily driven into ties—AND THEY WON'T WORK LOOSE!

You can BET YOUR BRIDGES on this rail creepage control

The *Macbeth Spike Anchor* combines more advantages than any other device for controlling rail creepage on bridges and approaches.

- One piece construction
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- Acts as an anchor . . . Prevents creep
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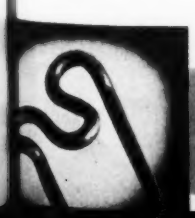
To get performance facts and comparative costs, write for Bullettin 4-S.



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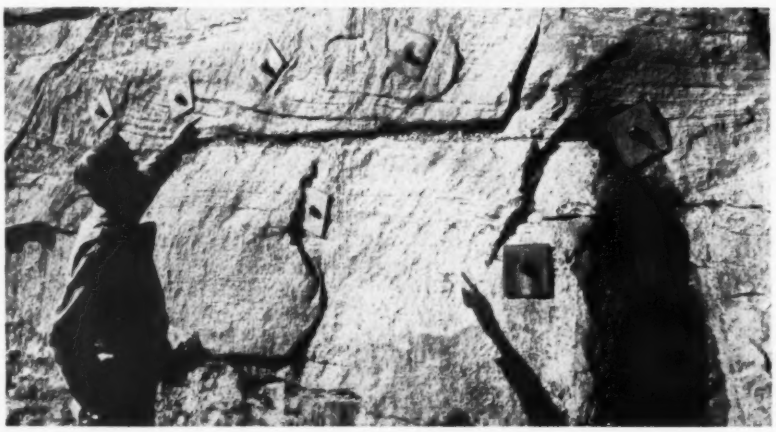
New Products (Cont'd)

other. One part is a self-contained welded frame with four adjustable legs which is used for holding the equipment in the on-track position. To this adjustable frame there are connected two removable runners which extend from the frame over the track itself and are utilized as the running rail from the track to the adjustable frame. On top of these units is mounted another frame equipped with four rollers which are arranged so that they fit into a grooved track mounted on top of the adjustable frame and the runners. Attached to the four-wheel carriage is a runoff on pivotal connections which rests on the rails of the track.

When setting off a piece of equipment, the machine is run up onto the four-wheel carriage where chocks are placed on all the wheels. The carriage is then pushed along the two running rails on to the main set-off, and into the clear.



ANCHOR BOLTS TO HOLD ROCK FACES

THE BETHLEHEM Steel Company, Bethlehem, Pa., has announced the development of a rock anchor bolt and plate, designed to reduce the dangers from rock slides by reinforcing the rock formation. According to the manufacturer these rock anchor bolts act in shear to resist slippage of rock strata and in tension to increase the frictional resistance between the strata by bolting the layers together. The strata thus stabilized act as cribbing to prevent additional slides from above.

The rock anchor-bolt assembly consists of a steel rod 1 in. in diameter and in lengths from 2 ft. to 10 ft., a regular square or heavy hexagon nut, a steel wedge, and a steel plate either 6 in. or 8 in. square and ¾ in. thick.

It is stated that any rock-handling crew can be trained to install these rock anchor bolts. In order to install the bolts a hole is drilled in the rock layer, using a pneumatic drill. The wedge is inserted in the slotted end of the anchor bolt and the bolt is inserted through the opening in the rock anchor plate and placed in the hole. The bolt is

(*Please turn to page* 71)

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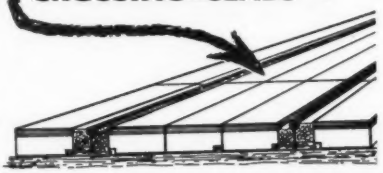
Precast Concrete
Edge Armored
CROSSING SLABS



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NO MORE *JACKING UP TRACK!*

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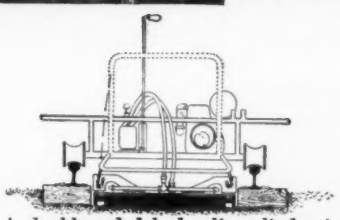
Tie-removing Team Now Eliminates This Slow, Costly Method

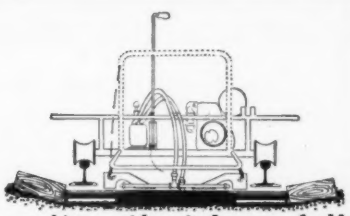
Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!*

After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.



A double-ended hydraulic cylinder is then lowered into the tie bed. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether*



working with single or double shoulder tie plates! The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.

WOOLERY
MACHINE COMPANY
2919 Como Ave. S. E., Minneapolis 14

USE Q AND C STEP JOINTS FOR DEPENDABLE SERVICE

Q and C Compromise Joints are designed with special reinforcement at the center where extra strength is most needed and are manufactured of high-grade heat treated steel to resist the impacts of heavy service.

They are made to fit all sections of rail.

Specify Q and C Step Joints on your requisitions.

THE Q AND C CO.

59 E. Van Buren St. Chicago 5 | 90 West St. New York 6 | 611 Olive St. St. Louis 1

TRACK ACCESSORIES

JOINT BARS

ANGLE BARS

ANGLE BARS for OLD RAILS

PLAIN SPLICE BARS

TRACK SPIKES

Inquiries solicited.

Manufactured by

TREDEGAR COMPANY

RICHMOND II, VIRGINIA

Van-Packer Chimney installed on railroad car repair track building

Packaged Masonry Chimney Goes Up in 3 Hours or Less On Railroad Buildings

LOW COST—The Van-Packer Packaged Masonry Chimney is easily installed in 3 man hours or less as new chimney or replacement of smoke jacks on car repair track buildings, maintenance of way buildings, small diesel repair shops, small passenger stations and freight home office buildings. Section-on-section design makes installation a one man job. Never needs to be replaced. Saves 30% to 50% over brick chimney construction.

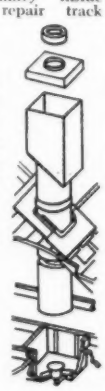
34% MORE DRAFT—Can be specified wherever 8" x 12" standard code brick chimneys are used. Develops 34% more draft than brick chimneys, cuts fuel bills.

SAVES SPACE—Ceiling suspended Van-Packer can be placed directly over heating unit, no wasted space. Chimney is supported with 4X factor of safety. Fire-safe, no clearance to wood rafters is necessary.

APPROVED FOR ALL FUELS—Time-tested masonry construction withstands temperatures in excess of 2100°F., Sections have insulating value of 24" solid brick wall. Listed by U.L., A.G.A. for all fuels. Delivered packaged and complete, all parts provided.

Triple connection to ceiling suspended chimney inside railroad car repair track building

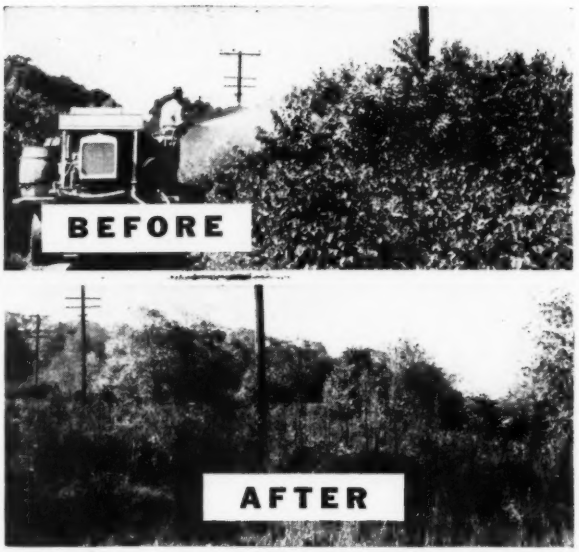
At right is an exploded view of the Van-Packer Packaged Masonry Safety Chimney. Illustration shows section - on - section construction for ease of installation, even after building has been completed.



Phone, write or mail the coupon below for all the facts on the

Van-Packer Packaged Masonry Safety Chimney

Van-Packer Corp. **209 S. LaSalle St.** **Chicago 4, Ill.** **CEntral 6-9892**	**FREE LITERATURE** Name ..... Address ..... City ..... State .....
Send me full facts on Van-Packer Chimney for railroad buildings.	



How to Keep Brush Down for Years!

Use Du Pont AMMATE® Weed & Brush Killer—Has Minimum Drift Hazard

Controls Brush but Lets Grass Come Back Quickly to Resist Erosion

Industrial users of "Ammate" Weed and Brush Killer say that when the original spray job is done well, brush is kept under control with nothing more than an occasional spot spray years later.

Even where right-of-ways adjoin sensitive crops, like cotton, you can rely on "Ammate" to do the job safely. That's because it's not volatile—reducing spray-drift damage to a minimum.

This year, be sure to include "Ammate" in your brush-control program. It's ideal on power, telephone pipe-line and railroad right-of-ways—wherever you have a brush problem.

Free illustrated booklet describes how to control brush in right-of-ways with Du Pont "Ammate." For your copy, write Du Pont, Grasselli Chemicals Dept., D-4026, Wilmington, Delaware.

Ammate®

Weed and Brush Killer

DU PONT
REG. U. S. PAT. OFF.

On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

then driven to refusal by the drilling device which was used to form the hole, thus forcing the wedge deep into the slotted end of the bolt, and exerting tremendous pressure against the sides of the hole and anchoring the bolt securely. The last step in the procedure is to bolt the anchor plate firmly against the rock by tightening the nut on the other end of the bolt.

The company states that, where special rock conditions necessitate the use of larger or longer bolts than usually furnished, special orders can be supplied as needed.

HAND TRACTOR AND ROTARY MOWER

A BONDED non-metallic clutch which replaces a metal clutch is said to improve the performance of the tractor manufactured by Gravely Tractors, Inc., Dunbar, W.Va. Other improvements include an improved muffler to decrease noise and the use of elastic stop nuts in the fabrication of the assemblies. This last item is said to lessen the tendency of a few fastenings to loosen when under stress. The rotary knife mower attachment has been improved by the addition of an extra knife. This addition now provides four cutting surfaces in the mower.

An improved oiling system has been adapted to the chain-saw attachment. This improvement is attached to the handle of the tractor and by means of a thumb-action pump lubricates the chain of the saw while in operation. This, it is said, lengthens the life of the chain and improves the saw's operation in hard woods.

NON-SELECTIVE WEED KILLER

"RITE-O-WAY" brand STA-KLOR spray powder is a newly developed high-strength TCA-chlorate formulation in soluble powder form. It is a product of the General Chemical Division, Allied Chemical & Dye Corp., New York.

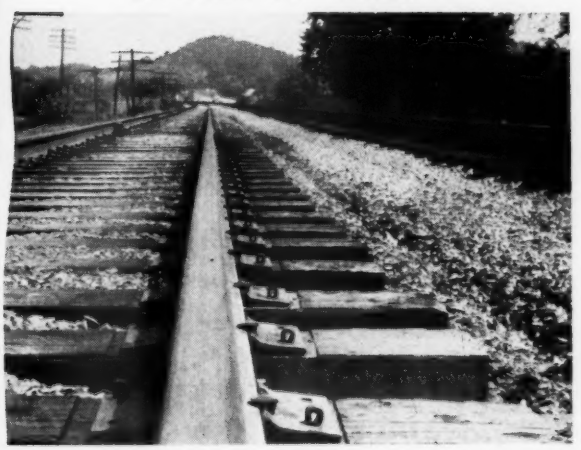
It is said that this new product provides easy and economical weed control by the use of regular labor crews in terminal yards, rip tracks, storage yards, driveways and other areas not accessible to spray-train treatment. It is said to give a thorough kill of both broad-leafed and grass weeds and other unwanted vegetation, and suppresses root growth and germination.

STA-KLOR is available in 100-lb. drums and may be used as a dust or a spray. In dusting 1 lb. is said to treat 200 sq. ft. and is applied by use of any spreader or sifter. For spraying any hand or power sprayer is suitable, and the mixture is applied at the rate of ½ lb. per gal. of water; 1 gal. of spray treats 100 sq. ft.

(Please turn to next page)

USE TIE PLATE LOCK SPIKES

for Minimum Annual Cost of Ties in Track



• hold gage • prolong life of ties

• save maintenance expense

LOCK SPIKES hold tie plates firmly in place on cross-ties and bridge timbers. They are quickly and easily driven, or removed, with standard track tools. Driven to refusal, the spread shank is compressed by the walls of the hole. Tie plates are held against horizontal and vertical movement under spring pressure. Play between the spike and the hole is eliminated—gage is held and plate cutting is overcome.

LOCK SPIKES not only become integral with the tie plate, but also the lateral pressure by the legs against the sides of the tie hole, binds the spike in the tie. This unique feature gives tight adhesion between tie and plate.

LOCK SPIKES were first installed in 1947. Since they have been in track, no maintenance whatever has been required. Cost of installing in track is low and comparable to cut spikes. The advantages and saving only found in Lock Spikes reduces the annual cost of ties in track and maintenance expense to a minimum. We invite your investigation.

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For additional information, use coupon, page 89

Mobile BANTAM®
For Off Track
Lifting-Digging Jobs

Gives you these advantages:

- ★ Travels at truck speeds to handle jobs anywhere.
- ★ Eliminates need for special work trains.
- ★ No delays waiting for rail-mounted cranes, draglines, etc.
- ★ Keeps single line trackage always open for regular traffic schedule.
- ★ ONE Bantam—with 9 front end attachments handles wide range of scattered jobs.

IF YOUR LINE is faced with ditch cleaning, placing culverts, clearing land slides, bridge repair, spotting steel, pouring concrete, unloading and loading ties and rails, handling stockpiled material or scrap metal and many other jobs—it will pay you to investigate the versatile Schield Bantam Method of getting jobs done faster, with less labor and at far less cost.

Remember, too, that Bantam's drive anywhere, at 35 mph. to handle these jobs—over highways, country roads or right-of-ways. No waiting for days for work trains to arrive.

T-35 BANTAM—mounts on specially designed Crane Carrier for heavy duty work. ⅜ Cu. Yd.—12,000 pound capacity, mounts quick-change front-end attachments which easily convert to trenching, dragline, clamshell, shovel, magnet, tie grapple, pile driver or concrete pouring. Bantam also available as ⅜ Cu. Yd.—5 ton Crawler Mounted lifting and excavating tool.

Free literature and specifications are yours for the asking. Write for a free demonstration in your yard or on your division.

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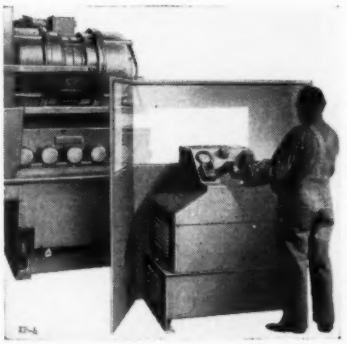
WORLD'S LARGEST PRODUCERS OF TRUCK-CRANES & EXCAVATORS

New Products (Cont'd)



FRICTION SAW POWER UNIT

A NEW HYDRAULIC power unit which provides push-button control of Kling Friction saws has been announced by the Kling Bros. Engineering Works, Chicago. The power unit, which is of the semi-automatic feed control type, is designed for use with either new or old friction saws. Starting or stopping the travel of the work and control of the carriage speed to any desired degree is provided by push-button control. Manual control is also available.

DIESEL WATER VALVE

WATERING has been reduced to the minimum of effort with the installation of a cushioned diesel water valve developed by the Golden Anderson Valve Specialty Company, Pittsburgh. This valve, it is reported, may be opened wide or tightly closed by the simple turning of an operating lever 90 deg. This lever may be located above ground at any convenient place and is provided with an indicator plate to show the "open" and "closed" position of the lever and operates on any water pressure from 15 to 200 psi.

This valve is available in globe or angle-body design in sizes up to 36 in. It is constructed with a heavy iron body, complete bronze trim and all bronze valve liner which extends down to and forms the valve seat. All wear is absorbed by renewable leather cups and a rubber seat ring. There are no metal to metal seats.

The valve is flanged, faced and drilled ready for installation. It drains the water column automatically when closed. It provides air and water cushioning to prevent hammer and shock.

HELPING guard the right-of-way from flash floods is just one of many maintenance chores for this Bucyrus-Erie 22-B dragline. Owned by the Texas Mexican Railway Co., it is building up a flood wall near Laredo, Tex., to protect the roadbed from a normally quiet creek which quickly overflows its banks whenever heavy rains fall.

That's only one way a crawler-mounted 22-B can help you combat emergencies — for when cloudbursts strike, your 22-B is readily available to battle wash-ins and washouts, to clear rock slides, etc. When it's needed at key spots, it's easily loaded under its own power onto a car or a low-bed trailer. You're ready to roll to danger areas in a few minutes.

In many other ways you'll find the versatile 22-B just about the handiest member of your division maintenance team. It can work year 'round on many vital maintenance tasks — trimming and widening banks, handling rails, loading riprap and ballast, ditching, building up fills, short line or spur roadbed construction. Send the coupon now for detailed information.

BUCYRUS ERIE

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BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

Gentlemen: Please send me literature on the 22-B.

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66E53

THE MONTH'S NEWS...

. . . among railway men—the associations—the suppliers

Changes in Railway Personnel

Engineering

R. H. Heinlen, assistant engineer for the Gulf, Colorado & Sante Fe, has been promoted to general foreman bridges and buildings and water service at Ft. Worth, Tex.

C. E. Chambers, assistant engineer for the New York Central, has been appointed district engineer at Cleveland.

E. A. McLeod, assistant engineer of structures on the New York Central, has been promoted to district engineer of structures at Detroit.

R. C. Turnbell, assistant designing engineer for the Nickel Plate, has been named special engineer, with headquarters at Cleveland.

3 MEN and a BURRO...

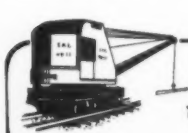
A Real Production Team!

A Burro Crane, its operator and two men on the rail will set a fast pace for the track gang to follow. Rail gangs equipped with a Burro Crane produce more work per shift at lower cost because Burros have the pace-setting speed and efficiency that helps them keep on schedule. Equally efficient with tongs, magnet, hook, bucket or dragline, Burro Cranes handle any job in stride. Fast travel speeds get them to the job in a hurry . . . heavy draw bar pull permits hauling work train and gang.

Only Burro Cranes Have:

- Fast travel speeds . . . up to 22 MPH
- Draw Bar Pull of 7500 lbs. often eliminates need for work train or locomotive
- Elevated Boom Heels for working over high sided gondolas
- Short tail swing — will not foul adjoining track
- Low overall height — a Burro can be worked and loaded on a standard flat car

Write for Bulletins on Burro Cranes



CULLEN-FRIESTEDT CO.

1320 SOUTH KILBOURN AVENUE • CHICAGO 23, ILLINOIS

W. C. Schakel, assistant engineer of structures on the Big Four, has been appointed district engineer of structures at Cleveland.

A. E. Drabnick, assistant architect, has been promoted to architect for the Louisville & Nashville at Louisville, succeeding **J. C. Haly,** who has retired.

W. R. Wagner has been appointed division engineer, Ashland division, of the Chicago & North Western with headquarters at Antigo, Wis., succeeding **R. D. Ransom,** who has retired after 44 years service. The Peninsula division of the North Western has been included under the jurisdiction of **William Wilbur,** division engineer at Green Bay, Wis., and the position of division engineer, Peninsula division, has been abolished.

Murray C. Taylor whose promotion to engineer of work equipment for the Louisville & Nashville at Louisville was announced recently (RT&S, Mar., p. 102) joined the L&N in 1924. He held various positions in the track and engineering departments until being named supervisor of work equipment in 1940, the position he was holding at the time of his recent promotion.

T. R. Klingel has been appointed engineer maintenance of way for the Soo Line, with headquarters at Minneapolis. **C. M. Hayes,** general roadmaster, has been named to the newly created position of supervisor—maintenance of way equipment, with headquarters at Minneapolis.

Spencer M. Percival, assistant vice-president of the Carolina & Northwestern (subsidiary line of the Southern) at Danville, Va., has been promoted to assistant vice-president in charge of maintenance-engineering, with headquarters at Charlotte, N. C., assuming the duties of the late **Randall F. Holden,** engineer maintenance of way at Charlotte.

Frederick W. Biltz, assistant chief engineer of the Reading, has been promoted to chief engineer, with headquarters as before at Philadelphia, Pa., to succeed **Edward L. Gosnell,** who has retired after 46 years of railroad engineering service, and **Harry F. Smith,** assistant to chief engineer, has been advanced to assistant chief engineer to succeed Mr. Biltz.

Mr. Biltz was born on August 15, 1892, at Ashland, Pa., and was graduated from Lafayette college in 1917 with the degree of Civil Engineer. He entered railway service in that year as a levelman on the Reading at Philadelphia, advancing to assistant supervisor of track in that same year. During World War I he served overseas as a lieutenant in the Transportation Corps, returning to the Reading in 1919 as assistant supervisor of track at Tamaqua, Pa. In 1922 he was promoted to supervisor of track at Olney Park, Pa., and in 1934 he was advanced to assistant division engineer at Reading, Pa. Two years later he was promoted to assistant to the general superintendent, and in 1941 Mr. Biltz was advanced to engineer maintenance of way. In 1943, during World War II, he again entered

(*Continued on page* 76)

"WOLMANIZED*"... the most versatile pressure-treated lumber... because it's clean, nonoily, odorless, paintable... with service records to prove its durability.

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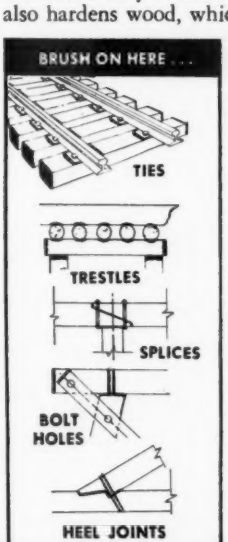
Stops Rot and Termites

BRIDGE TIMBERS LAST LONGER COST LESS...

WHEN THEY'RE SPOT-TREATED WITH OSMOPLASTIC

4 WAY CHEMICAL ACTION of Osmoplastic has proven itself highly effective over the years. B & B Engineers will find that this 4-way action seals out moisture and grit from the vital spots like bolt and spike holes, heel joints, splices and surfaces of stringers where they contact other members. Osmoplastic also hardens wood, which combats spike pull and reduces "plate cutting". Deep penetration by this famous wood treating product REINFORCES the preservative action of creosote in timbers, making structures last YEARS LONGER. CUTS maintenance costs drastically. So EASY to use! Just BRUSH ON where directed.



WRITE FOR FOLDER! Get all the details in this illustrated folder.

ALSO Our BRIDGE SPRAY SERVICE crews will "spray treat" complete existing structures for you. Ask us!

OSMOSE WOOD PRESERVING COMPANY
America's Biggest Manufacturer of Wood Treating Specialties
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the armed forces, in which he served as a colonel and commanding officer of the 712th Railway Operating Battalion in the E.T.O. Following his return to the Reading in January 1946, he was appointed to the position of assistant chief engineer.

Frederick W. Biltz

Edward L. Gosnell

Harry F. Smith

Mr. Gosnell was born on August 17, 1887, at Granite, Md., and was graduated from St. John's college, Annapolis, Md., in 1906. He entered railway service in September 1906 on construction work on the Baltimore & Ohio, serving at Cleveland, Ohio, Grafton, W. Va., and Cincinnati, Ohio. After a period out of railway service from 1914 to 1916, he returned to the B&O as resident engineer at Cincinnati, advancing to assistant engineer and office engineer at that point. In 1918 he was promoted to assistant to the chief engineer at Baltimore, and in 1930 he was further advanced to principal assistant engineer there. Mr. Gosnell was promoted to assistant chief engineer at Baltimore in 1941, holding that position until February 1946, when he was appointed chief engineer of the Reading.

Mr. Smith was born at Temperanceville, Va., and was graduated from Virginia Polytechnic Institute in 1928. After working briefly as an engineer for the Virginia State Highway Department, he joined the staff of the Reading in 1929 as an assistant supervisor of track, and became supervisor of track in 1936, in which capacity he served until 1943, when he was named assistant division engineer at Philadelphia. Two years later he was promoted to division engineer of the Shamokin division, and in 1948 became assistant superintendent of the Reading division. He was appointed assistant to chief engineer in December.

(*Please turn to page* 78)

The "PELICAN" PUMP

THE WONDER PUMP OF THE
Lightweight Field

AND THE LOWEST PRICED TWO-INCH PUMP OF ITS CAPACITY ON THE MARKET!

The "Pelican" self-priming centrifugal pump challenges any pump its size and type to equal it in performance.

Quickest priming, Fastest pumping, Most dependable

Suction Lift - up to 25 feet, sea level.

Automatic Self-priming - no ports, no valves.

Portability - weighs only 70 pounds, provided with carrying handle for easy portability.

Non-clogging - any muck or solids that will pass the intake strainer will pass through the pump.

Simplicity - the impeller, the only moving part, is mounted directly on the engine shaft and operates at engine speed.

The "Pelican" is a reliable, trouble-free, general utility pump small enough for easy handling and large enough for a wide range of applications in municipal utility field.

Write for bulletin No. 7-LW-13.

TWO-INCH 7,500 G.P.H.

PATENT NO. 2461925

FOUR GORMAN-RUPP LIGHTWEIGHTS

The Midget, 1½" - wgt. 62 lbs., 5500 g.p.h. Primes in 75 sec. at 25 ft. suction lift.

The Pelican, 2" - wgt. 70 lbs., 7500 g.p.h. Primes in 99 sec. at 25 ft. suction lift.

The Hawk, 2" - wgt. 110 lbs., 10,000 g.p.h. Primes in 47 sec. at 25 ft. suction lift.

The Eagle, 3" - wgt. 117 lbs., 18,000 g.p.h. Primes in 79 sec. at 25 ft. suction lift.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

Have you compared costs of weed control lately?

Weed control
is simple, economical
and long-lasting
when you use

Du Pont "Telvar" W
Weed Killer

One spraying with "Telvar" W gives rails and ties season-long protection from weeds and grasses.

As little as 40 to 60 pounds of Du Pont "Telvar" W per acre rid key areas of hazardous vegetation *for a growing season or longer!* This powerful weed killer works through the roots . . . gives long-term protection around sidings, track, switches, culverts, bridges, fences and railyards.

YOU'LL SAVE labor costs and the storage space with "Telvar" W. One spraying usually does the job for the season; no more bulky weed-control chemicals to store and spread . . . takes the place of cutting, mowing or expensive multiple spraying.

YOU'LL PROTECT property and machinery and make maintenance easier. "Telvar" W kills weeds and prevents them from fouling up equipment. Ties and roadbeds will last longer . . . need much less attention. Yards and tracks will always look clean, neat and efficient.

DU PONT REG. U.S. PAT. OFF. **TELVAR W** TRADE-MARK *Weed Killer*

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

YOU'LL PROFIT with "Telvar" W because it brings new efficiency and economy to weed-control programs. It's a wettable powder easily mixed with water. "Telvar" W is non-flammable, non-volatile and low in toxicity to humans and animals. "Telvar" W will not corrode spraying equipment.

For more information about Du Pont "Telvar" W, clip and mail the coupon to E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

Mail This Coupon for Free Booklet

On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

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Grasselli Chemicals Department Rm. D-4026
Wilmington 98, Delaware

☐ Please send me your booklet describing positive weed control with "Telvar" W. ☐ Send me the name of my nearest supplier.

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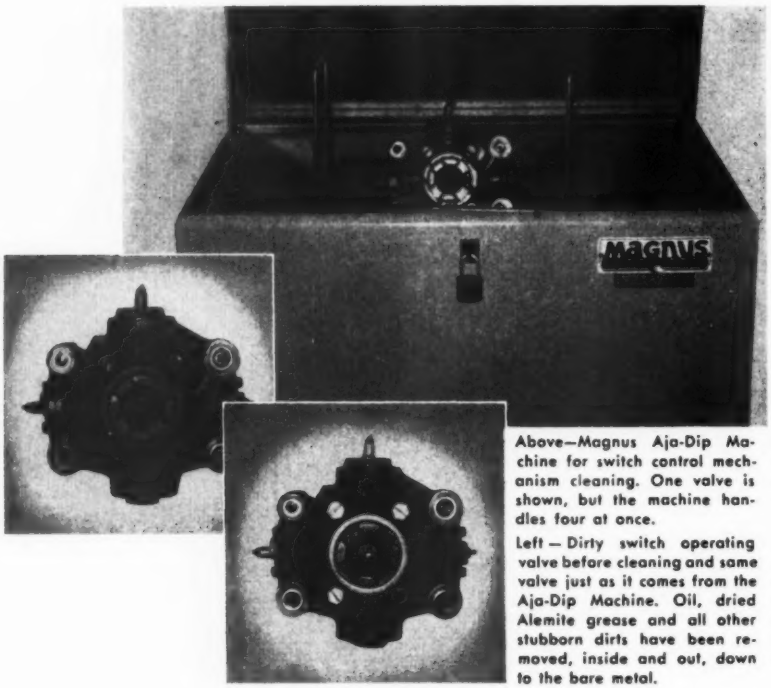
MODERN...LOW-COST

CLEANING OF SWITCH CONTROL MECHANISMS



Above—Magnus Aja-Dip Machine for switch control mechanism cleaning. One valve is shown, but the machine handles four at once.

Left — Dirty switch operating valve before cleaning and same valve just as it comes from the Aja-Dip Machine. Oil, dried Alemite grease and all other stubborn dirts have been removed, inside and out, down to the bare metal.

About 500 electric-pneumatic control switches are now cleaned better, faster and at lower cost by a Magnus Method.

One Man Cleans Four Valves in Less Than 30 Minutes

With virtually no dismantling, one man cleans four valves simultaneously in 30 minutes or less, using a Magnus Aja-Dip Cleaning Machine and Magnus Decarbonizing Cleaner. The valves are much cleaner, inside and out, than when dismantling and hand methods were employed.

This same machine and cleaner are also used for cleaning other switch equipment, such as operating pistons and interlocking apparatus.

Ask Magnus for complete details.

magnus CLEANERS

Railroad Division
MAGNUS CHEMICAL CO., INC.
163 South Avenue, Garwood, N. J.
In Canada—Magnus Chemicals, Ltd., Montreal
Representatives in All Principal Cities

Railway Personnel (cont'd)

R. A. Westergren, assistant division engineer on the Philadelphia division of the Pennsylvania at Harrisburg, Pa., has been promoted to engineer—maintenance of way and structures of the Washington Terminal, to succeed **H. J. McNally,** who has been appointed division engineer on the New York division at New York. **W. R. Catching,** supervisor of track on the Eastern division at Canton, Ohio, has been advanced to assistant division engineer to succeed Mr. Westergren at Harrisburg.

Milton S. Norris, whose promotion to regional engineer of the Baltimore & Ohio at Pittsburgh, Pa., was announced recently (RT&S, February, p. 68), is a native of Baltimore, and received his higher education at Johns Hopkins university and Carnegie Institute of Technology. Entering the service of the B&O

Milton S. Norris

in 1924 as a rodman in the engineering department at Baltimore, he was promoted progressively through various positions in that department, reaching the position of senior engineer at Pittsburgh on February 1, 1952, in which capacity he was serving when he received his recent appointment.

A. B. Ryan, whose promotion to chief architectural draftsman for the Louisville & Nashville at Louisville, Ky., was announced recently (RT&S, Mar., p. 102), was born at Adairville, Ky., June 4, 1921. After graduation from Vanderbilt University with a B.S.C.E. degree in January, 1948, he joined the firm of Edwin A. Keeble, architect, in Nashville, Tenn. In January, 1949 Mr. Ryan joined the L&N as an architectural draftsman and held this position until the time of his recent appointment.

John H. Wright has been named assistant division engineer of the Atlanta division of the Nashville, Chattanooga & St. Louis, succeeding **D. W. Burns.** Mr. Wright joined the NC&StL in December, 1943, as a draftsman after graduation from Vanderbilt University. In 1948 he was made inspector of construction at Cartersville, Ga., and later served as resident engineer in charge of construction on new yard facilities.

(*Please turn to page* 80)

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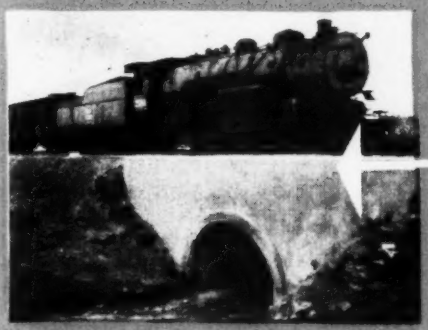
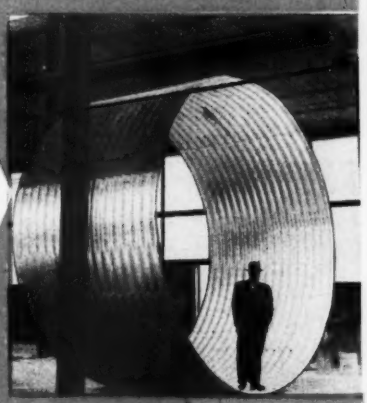
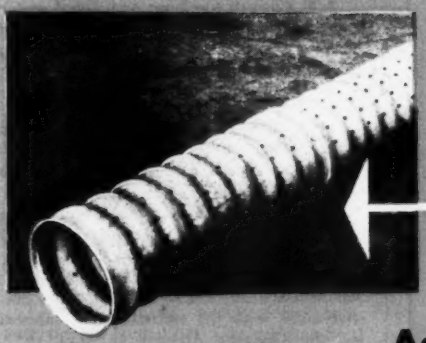


Corrugated Culvert Pipe



Sectional Plate Pipe



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Railway Personnel (cont'd)

N. R. Tucker, assistant division engineer for the Texas & New Orleans at Austin, Texas, has been promoted to division engineer at Houston, Texas, succeeding **J. E. Weatherly,** who has been transferred elsewhere. Mr. Tucker's successor is **J. N. Fuller,** principal assistant engineer at Houston.

Wendell R. Swatosh, assistant to superintendent construction for the Erie, has been promoted to assistant superintendent construction with headquarters at Cleveland. **Samuel B. Gill,** office engineer, has been appointed grade crossing engineer with headquarters at Cleveland, and **Walter O. Boessneck** has been named office engineer succeeding Mr. Gill. **Benjamin Elkind,** principal assistant engineer, has retired after more than 43 years service.

F. J. Fudge, assistant timber engineer of the New York Central, has been promoted to timber engineer, with headquarters as before at New York, to succeed **T. H. Friedlin** who has retired after 43 years of service.

Track

R. P. Howell, assistant supervisor of track on the Maryland division of the Pennsylvania at Wilmington, Del., has been promoted to supervisor of track on the Lake division at Ashtabula, Ohio, to succeed **H. E. Richards,** who has been transferred to the Susquehanna division at Northumberland, Pa. Mr. Richards replaces **R. F. Cole,** who has been transferred to the Eastern division at Canton, Ohio, to succeed **W. R. Catching,** who, as announced elsewhere in these columns, has been promoted to assistant division engineer at Harrisburg, Pa. **R. W. Rhoe,** junior engineer of track on the Philadelphia division at Columbia, Pa., has been advanced to assistant supervisor of track on the Lake division at Cleveland to succeed **P. F. Schwartz, Jr.,** who has replaced Mr. Howell at Wilmington. **H. F. Long,** supervisor of track on the Atlantic division at Camden, N. J., has been appointed supervisor of track, branch line, office of comptroller (special duty), at Philadelphia, Pa., to replace **J. G. Wilson,** who, in turn, has succeeded Mr. Long at Camden.

G. C. Chamberlain has been appointed roadmaster for the Sante Fe at Wellington, Kan., succeeding **G. C. Cleveland,** who has retired.

A. D. Henninger has been named general roadmaster for the Soo Line at Minneapolis, succeeding **C. M. Hayes** whose promotion to supervisor-maintenance of way equipment is noted elsewhere in these columns.

J. P. Garrett has been appointed assistant supervisor track on the Chicago division of the Pennsylvania replacing **W. K. Kearns.**

Carl S. White, Jr., assistant supervisor of track on the Southern at Danville, Va., has been promoted to supervisor of track at Manassas, Va., to succeed **Charlie B. Foster,** who, as announced elsewhere in these columns, has been appointed supervisor of bridges and buildings at Alexandria, Va.

Mr. White was born at Sycamore, Va., on January 26, 1921. Beginning his employment with the railroad as a laborer on the Danville division in May 1937, he later served as apprentice foreman, assistant foreman and section foreman. He had been assistant supervisor of track at Danville since February 1951.

Bridge and Building

R. H. Paschal, assistant roadmaster on the Frisco, has been appointed supervisor bridges and buildings for the Frisco's subsidiary line, the Alabama, Tennessee & Northern, at York, Ala.

Mr. Paschal was born at Louisiana, Mo., May 7, 1922, and graduated from the University of Missouri with a BSCE in 1949. He joined the Frisco as a student apprentice in 1950, and subsequently served as student supervisor and assistant roadmaster at Springfield, Mo.

Wilfred A. Huckstep, general building supervisor for the Missouri Pacific at St. Louis, has retired.

Mr. Huckstep was born at Isabell, Mo., November 17, 1889, and after holding various stenographic positions with the old Mobile & Ohio, the Cotton Belt, and the Pennsylvania & Southern,

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he started with the Missouri Pacific as a stenographer in the office of the general superintendent. Subsequently, he held the positions of chief clerk to the assistant chief engineer, chief clerk to the architect and general building supervisor. He served as president of the American Railway Bridge and Building Association in 1950-51.

W. L. Hawkey has been named supervisor B&B of the Illinois division of the Illinois Central at Champaign, Ill., replacing **W. R. Burke,** deceased.

Charlie B. Foster, supervisor of track on the Southern at Manassas, Va., has been appointed supervisor of bridges and buildings at Alexandria, Va.

Mr. Foster was born at Duncan, S. C., on November 13, 1920, and entered the employ of the SOU as a laborer at Spartanburg, S. C., in August 1942, subsequently serving in that capacity and as relief foreman at Salisbury, N. C. He became a rodman at Charlotte, N. C., in May 1947, and returned to Salisbury in November 1948. After serving in various capacities at Salisbury, he was advanced to roadmaster on the Danville & Western (SOU subsidiary) at Danville, Va., in September 1949. In February 1951 he became supervisor of track at Charleston, S. C., and in March 1952 was transferred to Manassas.

Walter Dilts, master of bridges on the Jersey Central Lines at Jersey City, N. J., has been appointed general bridge inspector to succeed **J. J. O'Connor,** who has been named construction inspector. **William B. Aumack,** whose former position as assistant master of bridges has been abolished, has succeeded Mr. Dilts as master of bridges.

Water Service

C. E. Fisher, engineer water service for the Virginian, has been appointed engineer of tests at Mullens, W. Va.

T. W. Hislop, Jr., water service engineer on the New York Central, has been named water service and corrosion engineer at New York.

Association News

Mississippi Valley Maintenance of Way Club

The April meeting will be held on the 12th at the Hotel DeSoto, St. Louis. This meeting will be addressed by J. P. Hiltz, Jr., chief engineer maintenance of way, New York Central System, on the subject, "Centralization in the Maintenance of Way Department." Mr. Hiltz' remarks will be supplemented by the showing of a film entitled "The Maryland Road Test," which was produced by the U. S. Bureau of Public Roads.

The next meeting of the club, which will be the annual meeting, is scheduled to be held on May 10.

(*Please turn to next page*)

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Association News (Cont'd)

Northwest Maintenance of Way Club

The next meeting will be held on April 22 at the Midway Civic Club, 1931 University Avenue, St. Paul, Minn., at 6:30 p.m. This meeting will be addressed by H. B. Christianson, special engineer of the Milwaukee Road who will discuss features of the several retarder classification yards built on his road in recent years. Mr. Christianson's remarks will be supplemented by the showing of a film depicting the operation of one of these yards.

Roadmasters' Association

Preliminary plans for the annual convention to be held at the Conrad Hilton Hotel, September 13-15, were discussed at a meeting of the Executive committee held at the Chicago Engineer's Club, on March 15. The meeting was directed by H. W. Kellog, president of the association. The Executive committee also discussed other current business of the association, including progress being made in getting out the Proceedings of the 1953 convention and the status of the commit-

(*Continued on page* 84)

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 13-15, 1954, Conrad Hilton Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 16-18, 1954, Palmer House, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual Meeting April 26-28, 1954, Chalfonte-Haddon Hall Hotels, Atlantic City. W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—E. C. Patterson, secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer, Room 1008, Frisco Building, 906 Olive street, St. Louis 1, Mo.

National Railway Appliances Association—I. B. Templeton, Secretary, 1020 So. Central avenue, Chicago 44; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Roy M. Edmonds, Secretary-treasurer, 1221 Locust street, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 13-15, 1954, Conrad Hilton Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

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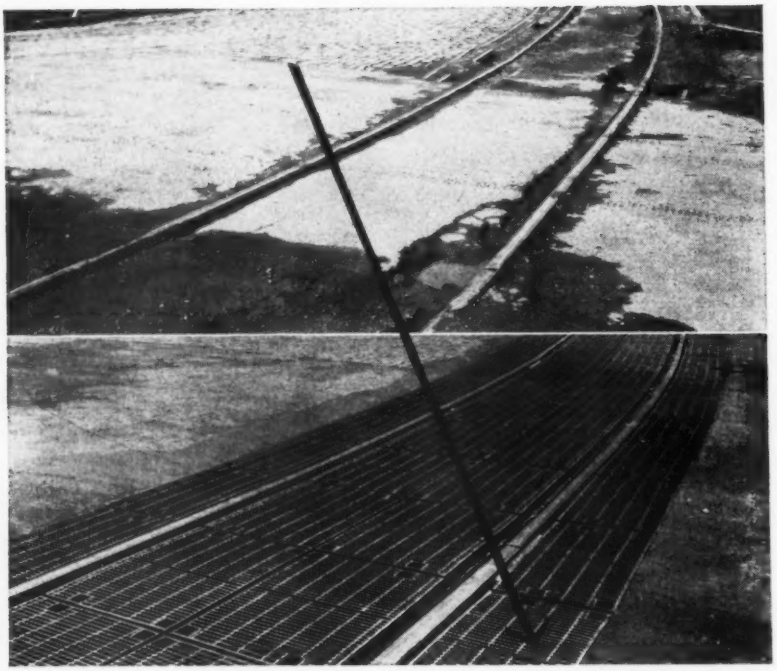

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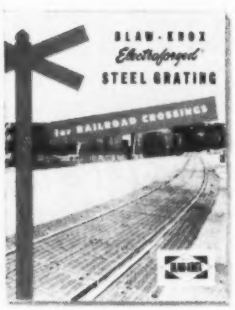

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Association News (Cont'd)

tee reports to be presented at the 1954 convention. A number of membership applications were also received. It was decided to hold the next meeting of the Executive committee at Chicago on May 24.

Maintenance of Way Club of Chicago

The next meeting will be held on April 26 at Welty's restaurant in the Field building, Chicago. The principal speaker will be J. P. Hiltz, Jr., chief engineer maintenance of way, New York Central System. At the time of going to press the subject of Mr. Hiltz' address had not been announced. Since this will be the annual meeting, new officers for the ensuing year will be elected.

Bridge & Building Association

Under the direction of President Lee Mayfield, the Executive committee of the Association met at the Chicago Engineer's Club on March 15. Preliminary plans were made for the convention to be held at the Conrad Hilton Hotel, Chicago, on September 13-15. It was reported at the meeting that progress is being made in preparing the Proceedings of the 1953 convention. Other routine business was transacted.

Metropolitan Maintenance of Way Club

The annual meeting of the club, with election of officers, will be held at the Railroad-Machinery Club of New York, at New York, on April 29. At the time of going to press the program for the meeting had not been announced.

Supply Trade News

General

D. V. Maher & Co., Cleveland, and **W. A. Blackford,** Oakland, Calif., have been appointed sales representatives in the railroad field for the **Security Locknut Corporation.** The representatives will handle Security's complete line of locknuts in their respective territories.

The **Golden-Anderson Valve Specialty Company,** Pittsburgh, Pa., has recently moved its general office to new and larger quarters at 1232 Ridge avenue. The engineering staff has been doubled and production facilities modernized and enlarged to take care of increased demand, according to the company.

The LeTourneau-Westinghouse Company is establishing an operation in Brazil to produce parts and some earth-moving machines. The operating company, a subsidiary of LeTourneau-Westinghouse, is named **Tratores do Brasil S. A.,** and will be located in the

(*Continued on page* 86)

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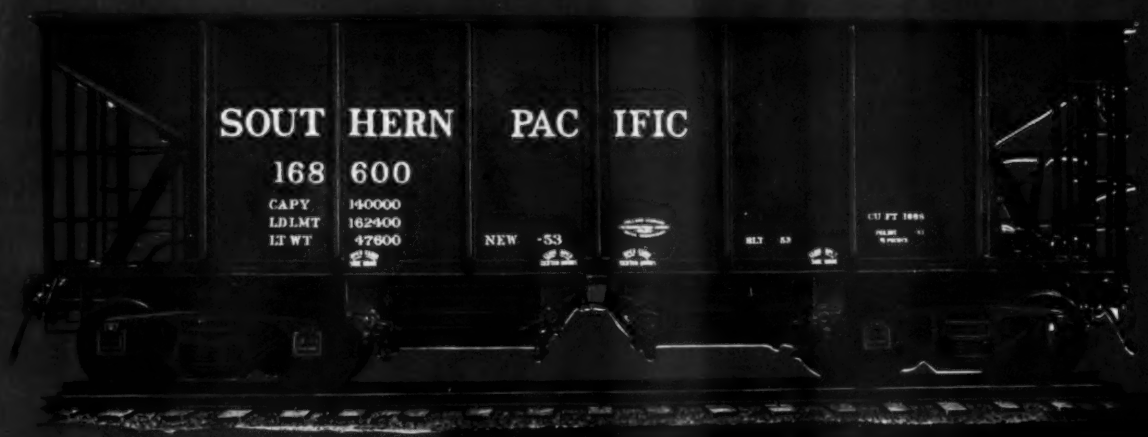

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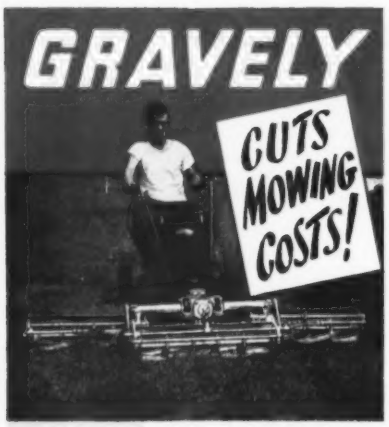

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3 SNOW REMOVAL TOOLS afford YEAR-ROUND USE, in every season — an example of Gravely's versatility.

28" SNOW BLOWER

MORE for your MONEY!

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Supply Trade News (Cont'd)

city of Campainas. Twenty-five acres of land are being purchased for the site.

The **Pacific Coast Borax Company,** a division of **Borax Consolidated, Ltd.,** has announced the establishment of a new Railroad Department in its Agricultural Sales Division which is to be headed by **G. C. Buskirk.**

Mr. Buskirk has been with the company since 1948, and prior to joining Pacific Coast Borax, he was assistant state weed supervisor of Nebraska.

Personal

R. N. Turner who was appointed railroad sales manager for the **LeTourneau-Westinghouse Company** (RT&S, Mar., p. 119) heads the company's newly-created railroad sales division which will organize and administer the merchandising of LeTourneau-Westinghouse tools to the railroad market.

Mr. Turner, who spent 4½ years with the Army Aviation Engineers during

R. N. Turner

World War II, was in the sales department of the Modern Machinery Company, a LeTourneau-Westinghouse distributor in Spokane, Wash. Prior to that, he was in the sales and service departments of the LaPlant-Choate Company where he achieved distinction as the company's top district sales representative.

W. Scott McCormick has been appointed to represent the **Maintenance Chemicals Department** of the **Pennsylvania Salt Manufacturing Company** in the transportation field.

Mr. McCormick will handle sales of cleaners for use in the transportation industry in the Ohio territory and in adjacent western Pennsylvania and southern Michigan counties.

He is a graduate of Grove City College and also attended Purdue University. Before coming to Pennsalt Chemicals, Mr. McCormick was a buyer for the Brush Electronics Company of Cleveland.

J. W. Sullivan has been named manager, Colorado district, for the **Wood Preserving Division** of **Koppers Company, Inc.** Mr. Sullivan, whose responsi-

(*Continued on page* 88)

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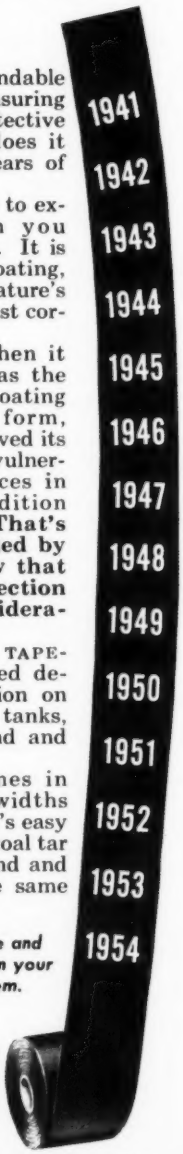

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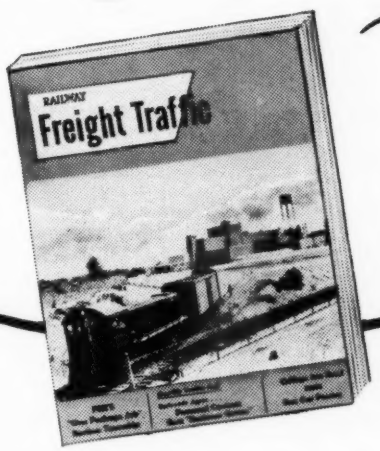

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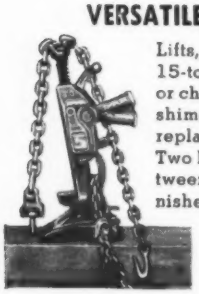
VERSATILE BRIDGE JACK



Lifts, pushes, pulls with 15-ton force on cap, toe or chain sling. Ideal for shimming, lining and replacing timber decks. Two base sizes to fit between ties. Chain furnished with bolt puller. Ratchet lever raising or lowering for safety. Double socket permits use in close quarters.

Other Simplex Jacks for **BRIDGE and BUILDING DEPARTMENTS**
Heavy duty ratchet jack with broad base and top. Aluminum housing for easier placement and carrying. Also aluminum alloy jack supports.

Ratchet Lowering Lever Jacks for SAFER CAR REPAIRS

Exceptionally efficient for fast jacking. Raise or lower notch-by-notch with maximum safety. Can not be tripped. No. 2029 at left has capacity of 20 tons, is recommended for refrigerator and empty car repairs. Other models for draft gear, bolster, journal and coupler repairs.

Other Simplex Jacks for the **MECHANICAL DEPARTMENT**
Standard journal jacks with fast ratchet action, car siding and flooring jacks, trailer supporting jacks, push-and-pull jacks and a complete selection of hydraulic jacks.

Pole Pulling and Straightening Jacks for the Signal Department

Two sizes, 5 and 15 tons for pulling or straightening all sizes of poles Pivots on base, when desired, to any angle. Can also be used for guy wire tightening or for pulling underground cable. Model A1538—15-ton capacity — available with aluminum housing which reduces weight 35 pounds.

WORLD'S LARGEST MFGRS. OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS

SIMPLEX JACKS
RE-MO-TROL UTIL-A-TOOL JENNY ROL-TOE

ALSO:

A variety of single acting Cable Reel Jacks for drums 30 to 96-in. diameters. Lightweight Model A1029 with Aluminum Housing.

Write for details in Bulletin RR52.

TEMPLETON, KENLY & CO. • 2543 Gardner Road, Broadview, Illinois

Supply Trade News (Cont'd)

bilities include plant operation, sales and procurement, succeeds **R. C. Johnson** who has been appointed special representative of the Colorado district office in Denver. **H. O. Brown** has been promoted to area sales manager for the Houston, Tex., office replacing Mr. Sullivan.

A. M. Riddle, manager of the market research department, has been named executive assistant to the president of the **Colorado Fuel & Iron Corp.** at Denver. Mr. Riddle, a native of Colorado, has been with the company for over 30 years. He was first employed in the fuel

A. M. Riddle

division at the Segundo coke oven plant and was later transferred to Pueblo. In 1930, he joined the president's staff and was appointed manager of the corporation's market research department in 1942.

Malcolm D. Salinger, assistant chief engineer of the **Cleveland Frog & Crossing Co.,** has been named chief engineer succeeding **George A. Peabody,** deceased. **Charles M. Cowles** has been appointed to succeed Mr. Salinger.

Jack Wright, Northern District manager of the **Hyster Company** on the west coast, has been named district manager of the northwestern district at Chicago. **James N. Rector,** manager of the Hyster retail store in Chicago, has been transferred to Atlanta, Ga., as district manager, southeastern territory.

W. W. Mossgrove has been appointed assistant to sales manager for the **Industrial Brownhoist Corporation.**

Norman E. Bateson, associate director of the engineering design division of the **Pullman-Standard Car Manufacturing Company,** has been named deputy director of the research and development division at Hammond, Ind.

S. A. Thompson has been named railroad sales manager for the **Sperry Rail Service,** a division of **Sperry Products, Inc.,** Danbury, Conn.

Mr. Thompson joined the Sperry Railroad Division staff in 1947 as a railroad sales engineer, and became assistant sales manager in 1951.

Manufacturers' Literature

Following is a compilation of free literature, pamphlets and data sheets offered by manufacturers to the railroad industry (#7-#18 described in advertisements in this issue). Circle the number (s) on the coupon below to receive the information desired; the requests will be sent direct by the manufacturers.

1. 250-TON RAILWAY CRANE. *Bucyrus-Erie Company.* 24-page profusely illustrated Bulletin #RCDE-1 "Bucyrus-Erie 250-Ton Railway Crane" completely describes this diesel-electric crane; contains numerous cross-section diagrams.

2. LIGHT-WEIGHT PIPE. *Naylor Pipe Company.* 4-page, 2-color bulletin #507 shows applications of the light-weight lockseam-spiralweld pipe and fittings, includes [illegible] specifications on pipe from 4" to 60" diameter.

3. TIE PADS. *F. Burkhart Mfg. Co. Div. Textron Inc.* 4-page folder (4th in series) "The Problem . . . The Answer . . . The Result" gives data and typical installations of Burkhart Tie Pads.

4. DIESEL ENGINES. *Harnischfeger Corporation.* "What You Should Know About Diesel Engines" uses the grade school "primer" technique for telling and illustrating the diesel story; shows in 28 pages the simplicity of the modern diesel.

5. WATER HOSE. *B. F. Goodrich.* New 4-page catalog #4800 describes, illustrates and gives specifications for various types of water hoses designed for specialized uses, including: long length, heavy duty hose; and, large diameter hose for high pressure water and air service.

6. MOVABLE-BRIDGE ELECTRIFICATION. *General Electric (Apparatus Sales Div.).* 12-page, 2-color bulletin GED-1982 "Movable-Bridge Electrification" explains why the nation's auto and railroad traffic growth necessitates new movable bridges, illustrates case histories of various applications.

7. WEED KILLERS. *General Chemical Div. Allied Chemical & Dye Corp.* Informative new booklet "Railroad Weed Control With General Chemical Rite-O-Way Weed Killers" tells about General's two weed control materials (the spray-train application for larger jobs and the spray powder for dry or wet application by regular labor crews).

8. NEW TRUCK-CRANE SERIES. *Clark Equipment Company.* Michigan "24" Fact-Folio contains full specifications, an interesting book "Get More Yardage Through Air Power," numerous action photos, and a complete overall picture of the new Michigan Series "24" (the model T-24 [illegible] model C-24 crawler shovel, clamshell, crane, dragline, hoe).

9. WEED KILLERS. *E. I. du Pont de Nemours & Co.* Booklet "Low Cost Weed and Grass Control With Du Pont Telvar W Weed Killer" gives complete information and applications of the "Telvar" W weed killer.

10. PACKAGED MASONRY CHIMNEY. *Van-Packer Corp.* Literature offered giving complete details and pictures applications of the Van-Packer packaged masonry safety chimney for railroad buildings.

11. RAIL GRINDER. *Mall Tool Company.* Additional information offered by Mall on the Model 23 combination rail grinder, the power unit adaptable for practically all rail applications.

12. CRAWLER-MOUNTED DRAGLINE. *Bucyrus-Erie Company.* Literature gives detailed information on the Bucyrus-Erie crawler-mounted dragline, adaptable for trimming and widening banks, handling rails, loading riprap and ballast, ditching, building up fills, etc.

13. JACKS. *Templeton, Kenly & Co.* Bulletin RR52 gives complete details and shows uses of the Simplex line of jacks, both mechanical and hydraulic, including track jacks, bridge jacks, ratchet lowering lever jacks, and pole pulling jacks.

14. STEEL GRATING. *Blaw-Knox Company.* Bulletin #2448, "Blaw-Knox Electroforged Steel Grating for Railroad Crossings" gives complete information on steel grating applications for railroads.

15. CROSSING SLABS. *Permacrete Products Corp.* Bulletin #CX-1 gives detailed information and typical uses of Permacrete precast concrete edge armored crossing slabs, steel reinforced concrete with treated oak fillers.

16. MANGANESE STEEL CROSSINGS. *Ramapo Ajax Division American Brake Shoe Company.* Descriptive folder offered describing in detail Racor depth hardened manganese steel crossings.

17. RAILROAD CRANES. *Cullen-Friestedt Co.* "Burro Cranes" bulletins offered describing, illustrating and giving applications and uses of this crane in various railroad jobs.

18. PUMPS. *The Gorman-Rupp Company.* Bulletin No. 7-LW-13 describes and shows many applications of the "Pelican" pump, the self-priming centrifugal two-inch 7,500 G.P.H. pump.

Reader Service Department — **APRIL, 1954**

Railway Track and Structures

30 Church Street, New York 7, N. Y.

Please send literature circled below:

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Also, please send me additional product information as follows: (product & page number) .....

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√ SURFACE GRINDING
√ FROG GRINDING
√ RAIL SLOTTING
√ SWITCH POINT GRINDING
√ CROSS GRINDING
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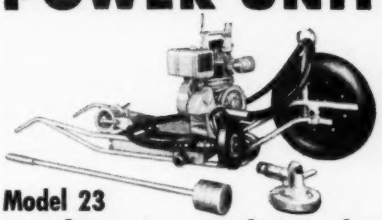
√ DRILLING

POWER UNIT



Model 23
Combination Rail Grinder

Yes this one compact MALL power unit adapts for practically all rail maintenance applications. It develops 8¼ hp. with output speeds from 3100 to 4500 rpm... and weighs only 190 lbs. Mounted on a wheelbarrow type frame, its maneuverability and utility is unbeatable. The entire unit with outrigger can be rolled on the rails, following the operator from one rail joint to the nest. Attachments quickly snap on and off with MALL'S patented "slip lock" connections.

Takes only one man to transport and operate it for all applications.

40 Factory-Owned Service Warehouses, Coast to Coast, To Serve Our Customers Quickly and Capably.

MAIL THIS COUPON NOW!

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The Right Power
Costs Less . . .
"U.S." Electric Plants
are engineered for
Railroad needs!
Choose the right size and right type Electric Plant for each job from more than 300 models in the "U.S." line. Installing a unit designed for the job insures efficient operation. (Keeps costs down, too!) For all maintenance needs and stand-by use on signal systems. Write for information.
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LOW COST UNDERPINNING
FOR
PLATFORMS
Sonotube
FIBRE FORMS
for round concrete columns
Save time, labor and money . . . form piers, underpinning, posts for station platforms, bridges, other railway structures with SONOTUBE Fibre Forms.
Low cost, lightweight, easy to handle.
Sizes 1" to 36" I.D.—up to 50' long. Supplied in specified lengths or sawed to your requirements on the job.
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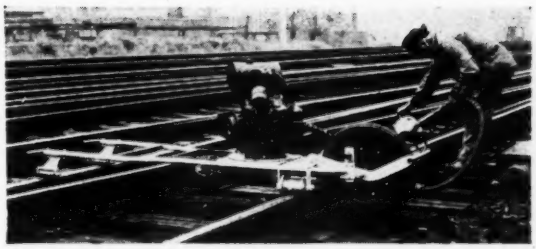

SPEED . . . POWER . . . ECONOMY

Work hand in hand with your track gang when you equip them with the

RTW P-44 TRACK GRINDER

Look at these many advantages:

- Grinder's 360° swivel engine mount prevents short bends and kinking of flexible shaft.
- Clutch assembly in the engine protects shaft from overload.
- Three position wheel clears switches and crossovers easily. Quickly adjusted for off track use.
- Light and compact, it gets on and off the track fast. Can be used under heavy traffic.
- Quickly adaptable for auxiliary equipment: Straight Wheel Hand Piece, Angle Hand Piece for Cup Wheel, Cross Grinder Guide and Track Drill.

Write us for further details.

Railway Track-work Co.

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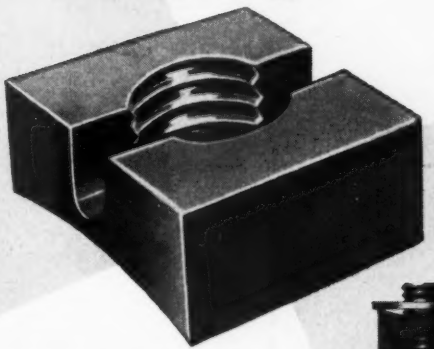
TRACK MAINTENANCE EQUIPMENT
RAIL GRINDERS—SWITCH GRINDERS—CROSS GRINDERS—TRACK LINERS SURFACE GRINDERS—RAIL DRILLS—BALLAST EXTRUDERS—BIT SHARPENERS—TIE NIPPERS—GRINDING WHEELS—CUT-OFF WHEELS—BRUSHMASTER SAWS

Lewis **LOKTITE NUTS**



Specify Lewis Loktite Speed Holding Nut #2 for positive lock . . . no other nut required. Equals tensil strength of bolt. Trimmed sides provide a close wrench fit. *For Double-Life, fewer replacements, specify Hot-Dip Galvanized finish!*

Side view, reduced, showing areas of friction lock.

See your Lewis representative, or contact factory for further details.

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LARGE AREA PROTECTED

For emergency electric power in its Winnipeg yards, Canadian National Railways depends on a Caterpillar D318 Electric Set.

The compact standby unit is installed in the railway's steam generating plant in the city yards. It stands ready to supply instant power to coal conveyors, forced and induced draft fans, stoker motors, boiler pumps and emergency lights.

With a dependable, self-regulated Caterpillar Electric Set, you can forget the troubles a power failure could cause. These sets can be started by manual, remote, and completely automatic systems. Cat Electric Sets can be started, reach operating speed and take over the load — all in a matter of a few seconds.

And you get this dependability at minimum cost. All Cat® Electric Sets — there are 12 sizes up to 315 KW — operate on low-cost No. 2 furnace oil without fouling, even when idling. They need very little space. They are easy to install — no concrete foundation is necessary.

And the operation of these self-regulating units is so simple that they require neither complicated switch gear nor a trained electrician.

Here is a power sentry that guards your operations *and* your costs. Your Caterpillar Dealer, an expert on power plants, is ready to prove the benefits of Cat Electric Sets. Have him show you the model that exactly fits your needs!

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CAT POWER MEANS DEPENDABLE POWER

Formula for Fast, Full-Season Weed Control:

IN DRUMS OR SHAKER BOXES

Nalco® H-174

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Nalco MECHANICAL SPREADERS

Nalco H-174 granular Weed Control Chemical, distributed with Nalco Track Mechanical Spreaders, is the fast, positive way to get full-season weed control in yards, along sidings and right-of-way. Around buildings, bridge and trestle footings and in other hard-to-reach places, the portable or off-track Mechanical Spreaders or the convenient Nalco H-174 Shaker Box do the job quickly, without waste.

Nalco H-174 action is powerful and lasting. One treatment, preferably before emergence, provides sufficient treatment to prevent growth during the season. Application after emergence provides a thorough kill and stays in the soil for months to prevent regrowth. H-174 is non-hazardous to humans and animals; safe to store and handle.

Your weed control requirement will determine the type of Nalco Mechanical Spreader best suited to your use. Whether manually-operated sling-type, mechanically-driven push-cart, or push-car-mounted, these spreaders are designed to give you accurate dosage control and excellent distribution of Nalco H-174.

Full data and prices on Nalco Weed Control Chemicals and Spreaders will be sent promptly upon request. Act now for a successful start on a one-treatment, all-season weed control program.

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FREE-FLOWING Nalco H-174 will not pack or clog in drums, boxes or spreaders. Uniformly-sized granules assure even distribution, eliminate dust nuisance and waste.

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EASY APPLICATION

BUT YOU GET THOROUGH PROTECTION . . .

with TEXACO RAIL JOINT LUBRICATION

Texaco Rail Joint Lubrication can be applied quickly and easily — without taking the joint down or interfering with traffic. You simply spray *Texaco Rail Joint Lubricant* behind and above the joint bar. Note (in the picture showing a joint disassembled for inspection) how it penetrates into the fishing surfaces and around the bolts. That's why it's tops for keeping joints free . . . why it prevents rusting, kinks, pull-in-twos and extends bolt life.

Texaco Rail Joint Lubricant gives lasting protection. The lubricating film resists moisture and is not affected by temperature changes. Leading railroads have proved that Texaco Rail Joint Lubrication materially reduces maintenance costs.

Let a Texaco representative give you all the facts. Just call the nearest Railway Sales Office in New York, Chicago, San Francisco, St. Louis, St. Paul or Atlanta; or write The Texas Company, *Railway Sales Department,* 135 East 42nd Street, New York 17, N. Y.

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